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ABSTRACT

Investigations using English have shown that a number of linguistic constructions associated with reporting verbs, and verbs concerning plans, present comprehension difficulties to children over the age of five. The corresponding constructions in Greek involved ambiguity appreciation, and tests of monoglots and bilinguals indicated that a cognitive developmental stage is implicated in ambiguity appreciation. Striking contrasts between the results from Greek children, who did not appreciate ambiguity, and what would be expected on the basis of English studies forced an appeal to semantics in explaining comprehension difficulty. Testing a wide range of constructions with fewer reporting verbs demonstrated that semantic theories which invoked speakers' intentions could not provide a general explanation of comprehension difficulties. What seemed to be developing was a gradual mastery of the way reporting verbs gave meaning to, and took meaning from, the constructions in which they can stand. The fact that results from monoglots were language-particular made possible a test of bilingual children to evaluate theories about their development. Existing theories implied that results from bilinguals would be qualitatively different. There was no support for such predictions. What occurred was a greater frequency of the same misapprehensions about the meanings of reporting verbs that had been obtained with monoglots.
(Author/CFM)

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5 title of project

Later Development of Syntax in Bilingual and Monoglot Children

6 aims and methods of research (up to 300 words)

Investigations using English have shown that a number of linguistic constructions associated with reporting verbs, and verbs concerning plans, present comprehension difficulties to children over the age of five. Explanations of the difficulties appeal to syntactic principles because the class of verbs concerned can be distinguished formally. The corresponding constructions in Greek involved ambiguity appreciation and tests of monoglots and bilinguals indicated that a cognitive developmental stage is implicated in ambiguity appreciation. Striking contrasts between the results from Greek children, who did not appreciate ambiguity, and what would be expected on the basis of English studies forced an appeal to semantics in explaining comprehension difficulty. Testing a wide range of constructions with fewer reporting verbs demonstrated that semantic theories which invoked speakers' intentions could not provide a general explanation of comprehension difficulties. What seemed to be developing was a gradual mastery of the way reporting verbs gave meaning to, and took meaning from the constructions in which they can stand - a piecemeal growth of language-particular knowledge.

The fact that results from monoglots were language-particular made possible a test of bilingual children to evaluate theories about their development. Existing theories implied that results from bilinguals would be qualitatively different. There was no support for such predictions. What occurred was a greater frequency of the same mis-apprehensions about the meanings of reporting verbs that had been obtained with monoglots. There was therefore a small difference in the overall number of constructions correct. The difference could be attributed to differences in formal education, since the extent of Greek usage, as indicated by questionnaire results, did not predict bilingual performance at all.

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Research Assistant from 1st July, 1974 to 30th June, 1976

10 publications

Please list all publications which have arisen from the project or are in preparation, with details of author, editor, publisher and date of publication. If there are no such publications, please enter NIL. (If you need extra space please continue on paper the same size as this.)

Nil, although two conference papers may appear if an agreeable publisher may be found,(see below).

A conference paper was given at the Third International Child Language Symposium, London, 3-5th September, 1975.

Two conference papers were given at a University of Wales colloquium 22 - 24th March, 1976

Two conference papers were given at the Joint 10th E.L.E. meeting and 3rd Salzburg Psycholinguistics meeting in Salzburg, Austria 28th - 30th August, 1976. These may be in the proceedings if published.
Invited contributions were given at an A.K.S. colloquium, November 20 and 21st in the Technische Universität, West Berlin.

An invited contribution is to be given at the University of Kassel, Kassel, West Germany by the senior investigator on 3rd December, 1976 entitled "Language Acquisition Strategies" which is to be published.

Papers in Preparation: "Comprehension of ambiguous constructio-ns by Greek-speaking children"; "An upside-down difficulty hierarchy with ASK, TELL and PROMISE constructions"; "Storage problems with theories about bilingualism: evidence and conceptual artifacts". (Choice of journals not yet decided)

Ph.D. Thesis: by D. Natsopoulos, submitted to the University of Reading, entitled "Later linguistic development in Greek bilingual and monoglot children".

Note: Abstracts and conference papers not already sent are enclosed with the final report.

should be on paper the same size as this, within margins the same size as those on this form, heading each page 'Final Report (cont'd)', numbering the pages in sequence and clipping them to the back of this form. If you wish to submit any other additional material not already sent in to the Council, two copies should be sent in with this report.

LATER DEVELOPMENT OF SYNTAX IN BILINGUAL AND MONOGLOT CHILDREN : FINAL REPORT.

Foreword

Because the investigators in this project would be in different parts of Europe, when wanting to prepare papers for publication, it was necessary to give details of procedures and results in the final report, so that it could be cited as the basic reference. This means that the report can be read omitting some of the details. To do that, the following page references are required :

Pages 2 - 11 (Chapters 1 and 2);

Pages 12 - 17 (Description of difference between English and Greek relevant for the experiments);

Pages 30 and 59 (summary of Chapter 4);

Pages 60 and 81 (summary of Chapter 5);

Pages 82 and 113 (summary of Chapter 6);

Pages 1[illegible] to 119 (Chapter 7).

LATER DEVELOPMENT OF SYNTAX IN BILINGUAL AND MONOGLOT CHILDREN : FINAL REPORT

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CHAPTER ONE

The research described in this report represents a move in the direction of including other languages than English in the enthusiasms that followed the Psycholinguistics of the 1960's (cf. Bellin, 1975). The senior investigator attempted to test general hypotheses about language learning using Welsh (Bellin, 1976). While engaged in this research he heard of the interest of Mr. Natsopoulos in Psycholinguistics. The contact was a colleague from Thessaloniki, who was visiting Reading for a year. Mr. Natsopoulos was interested in a number of aspects of Psycholinguistics which led to two publications in the Annals of the Faculty of Philosophy, University of Thessalonki. These were "Genesis and Development of Language" and "Language and Thought: Four Theoretical and Experimental Approaches" (Natsopoulos, 1974 and 1975). What the two researchers had in common was a concern that theories put forward as if they had universal application should be investigated using other languages than English. Theories about younger children seemed to be getting such attention, but not theories about older children. Mr. Natsopoulos was enabled to come to Reading by a British Council grant in 1972. He spent some time familiarizing himself with research methods and statistical techniques which led to an experiment with English children (see Natsopoulos, 1976, ch. 2). This experiment suggested that picture interpretation tasks followed by "diagnostic" questioning were satisfactory for studying older children's comprehension. The experiment on bilingual children described in Chapter 3 of this report led to the application for a project grant, and then three experiments were conducted, which are described in Chapters 4, 5 and 6 of the report. Natsopoulos (1976) discusses the theoretical implications of the experiments extensively. What was wanted in this final report was a record of the basic findings and procedures that both researchers could refer to in projected articles to be submitted for publication.

The progress report covering the first six months of the project describes problems encountered after political changes in Greece, but these were very unusual circumstances. However, without the efforts of the research assistant, the project could have foundered then. An extension was made necessary because of the delays. The role of the research assistant was central in many other ways. The research was conducted from within the minority group involved, and this contrasts with many attempts to investigate bilingualism. Testing a minority group on the majority language is easily done, but it can be reacted to as an intrusion by the groups being investigated. Research with lower status minority groups than the one considered in this project is very important, if the wider issues raised in Chapter 7 of the report are to be discussed in an informed way. Working from within the minority group is an essential corrective to the impressions gained from sources like educational psychologists and social welfare agencies. Educational psychologists receive problem cases where factors like bilingualism may only complicate a communication problem rather than represent any strain on language acquisition capacities.

The immediate future plans of the researchers on this project conern wider issues only indirectly. More information is needed about the production capabilities of children like the ones that have been tested on comprehension in this project. There are plans for research on the mastery of the morphology of the verbal system. This is an area where there is a contrast between English and Greek in the way verbal categories are represented. A project on the verbal system could lead to the construction of tests that might be of use with other languages. The choice of topic is motivated by incidental findings in this project, and their agreement with findings reported from the U.S.A. by Seaman (1972).

To prepare the ground for a new project, the senior investigator has invited Dr. Maria Tenezakis, a Senior Lecturer in Education at the University of Macquarie in Australia, to spend a sabbatical year in Reading. Dr. Tenezakis has worked with bilingual Greek children in Australia. On the way to Reading, she will spend some months at the "Kendron Ekpedheftic'on Melet'on" in Athens. Mr. Natsopoulos should be in Greece at the same time, and it is intended to arrange for the senior investigator to give seminars.

The senior investigator with Dr. S. Felix of Kiel, W. Germany, is organizing a session on research methods for a projected Psycholinguistics meeting in Salzburg, Austria, during 1977. There is correspondence going on with researchers on other languages who would be interested in morphology acquisition. Many of these were met at the Third International Child Language Conference, held in London in September, 1975.

It is very important to follow up the project described in this report now that valuable contacts have been made with members of the Greek community in London.

CHAPTER TWO

The study which influenced this research considerably was that by Carol Chomsky (1969). She found that children as old as eight had difficulty in comprehending constructions with the verbs promise and ask, but not tell. Her results were replicated by Kessel (1970), using a picture interpretation task which resembled the one adopted for the project. Natsopoulos (1976) found that testing some of the same constructions with dolls (like Carol Chomsky) and with pictures (like Kessel) produced a non-significant trend favouring the superiority of the picture method. Twice as many children succeeded with the picture method when failing on the same construction with the dolls method, but the obtained frequencies were such as to result in a non-significant trend. Because pictures were easy to carry around, and because of the trend, a picture interpretation task was adopted for the project.

The data analysis in the project relied on developments in scaling theory associated with papers by Bart and Krus (1973) and Airasian et al.(1975). This has the advantage of being a more general approach than the one used in previous studies. Natsopoulos (1976) worked through the data of previous investigations with these methods and showed how the analysis confirms the description of the results provided by the original investigators. However, the methods give more information than the alternatives. Chomsky (1969) was mainly interested in whether the constructions she tested formed a Cuttman scale, and her approach does not allow a description of difficulty relations where such a scale does not exist. The methods of analysis used for this report show Guttman scales where they exist, but they also reveal other difficulty relations between constructions. The approach is therefore superior in that it is more comprehensive.

It is important to stress that the results of this project may affect the interpretation of results in the English studies, but do not necessarily conflict with them. With one or two children who know Greek in Reading, the equivalent English constructions were tried out, and the children showed exactly the same behaviour as the English studies report. The investigators are quite satisfied that the basic data of others are trustworthy, although testing the same children in both languages was not considered a worthwhile procedure, since it must look to the subject being tested as if the experimenter cannot make up his mind which language he is going to speak.

When the senior investigator gave a conference paper in Salzburg, August 1976, describing the "upside down" difficulty hierarchy reported in Chapter 4, a heated discussion ensued. However, Thomas Roeper of Harvard University reported that he had re-tested some of the relevant constructions in the passive voice. This was to ensure that children went by the order of elements in the constructions. The behaviour he found accorded with what would be expected if a syntactic basis for responding existed. The fact that Greek-speaking children do not behave in this way adds interest to the test of bilinguals.

The analysis of Chapter 6 of this report relies on the additive nature of the chi square statistic. An alternative approach would be to test the fit of linear models for categorical data, using the data in Table 6.3. A statistician has been consulted about the applicability of this approach, since it would indicate whether age or bilingualism was a better predictor of sucfess. It is hoped to produce a paper on the topic for an appropriate journal, provided that the difficulty relations between the constructions do not invalidate the procedure. The final report has concentrated on statistical treatment which gives a full description of the results, rather than more elaborate treatments, since papers for publication will need to refer to the report for details of procedures, pictures and some results.

Since the basic task was a picture interpretation task, and all interviews were recorded in entirety, it was necessary to have cassette recorders and a plentiful supply of cassettes. Less money was spent on cassettes than the senior investigator anticipated because the assistant was very energetic in transcribing interviews. Less money on tape recorders was spent because the facilities provided in the London schools were better than expected. It was thought likely that recordings would be made with ambient noise. A stereo recorder was budgeted for, since listening to a stereo recording with headphones can overcome such problems. But a separate room was provided free of charge by the I.L.E.A., although the proper charge should have been £4.50 an hour at the time of testing.

There was much generosity shown by those who took on work involved in the project. The charges for the pictures were very reasonable, considering the number of hours of discussion as well as drawing that were involved. Hospitality shown on the trips to Greece cut costs considerably. The whole project was conducted at unrealistically low costs, from the point of view of future budgeting. Balances were left in the appropriate accounts, to economize in accordance with requests from the Research Council.

From the point of view of structural differences between English and Greek the following one appeared to be of importance for conducting experiments using Greek.

Greek, unlike English, has no infinitive (Thompson 1967, p. 18). It uses finite dependent clauses where English uses non-finite dependent clauses.

Consider the following examples with the quivalent constructions in both languages associated with the main clause verbs ask (question) promise and tell :

"John asked Mary what to feed the cat"or"John asked Mary what he should feed the cat." For these two sentences - to use a clause/sentence distinction in describing differences and similarities between the two languages - Greek uses only a finite dependent clause to cover both the non-finite dependent clause (to feed) and the finite dependent clause (he should feed),by means of the particle na followed by a finite dependent clause verb (ta'isi, 'feed') :

O J'annis r'otise ti M'eri ti na ta'isi ti gh'ata
(art.) (John) (asked) (art.) (Mary) (what) (to) (feed) (art.) (cat)
John asked Mary what to feed the cat
or John asked Mary what he should feed the cat.

When English uses a non-finite dependent clause (to + infinitival verb) its subject is not denoted.To be correctly understood, the NP1 (John) must be selected as the subject of the action described in the non-finite dependent clause. The equivalent Greek sentence poses the same problem. NP1 (J'annis) must also be assigned to the finite dependent clause verb as the subject of the action.

In English the sentence with a finite dependent clause has the second subject shown in the surface structure (the pronoun he). But Greek indicates the subject but not its gender. So, the problem of assigning the correct subject to the finite dependent clause verb exists as in the case where English uses a non-finite dependent clause (to + infinitival verb).

Figure 3.1. shows syntactic relations both for non-finite and finite dependent clauses in the constructions with the verb ask (ask = question) in English. The same figure shows relations associated with the equivalent verb in Greek.

Figure 3.1

	V1	V2
NP_1	X	X
NP_2		

The mark in the top right-hand box indicates that NP_1 is the unstated subject of the dependent verb (V2).

Sentences with the verbs promise and tell, using non-finite dependent clauses in English, correspond to Greek sentences with the equivalent verbs followed by a finite dependent clause (na + the subjunctive).

John promised Mary to study more.
O J'annis iposxjéthikje sti M'eri na melet'ai periss'otero
(art.) (John) (promised)(prep.) (Mary) (to) (study) (more),

and

John told Mary what to study
O J'annis 'ipe sti M'eri ti na melet'isi
(art.) (John) (told) (prep.) (Mary) (what) (to) (study).

In the former example NP_1 (John) is the subject of the non-finite (English) and finite dependent clause verb (Greek), and in the latter NP_2 (Mary) is the subject in both languages. Figure 3.2 depicts syntactic relations in the equivalent sentences with the verb promise in both languages and Figure 3.3 those where the verb is tell.

Figure 3.2

	V1	V2
NP_1	X	X
NP_2		

Figure 3.3

	V1	V2
NP_1	X	
NP_2		X

In Figure 3.3 the mark in the lower right-hand box indicates that V2 has NP_2 as its subject. In all cases, the subject of the main verb (V1) is NP1, as is shown by the mark in the top left-hand box.

What manuals of Greek do not point out is a side-effect of the use of a finite clause in Greek. Consider the following example :

I M'eri z'itise ap'tin Anna na tin p'ai sinem'a
(art.) (Mary) (requested) (prep.) (Anna) (to) (her) (take)(movies)
Mary asked Anna to take her to the movies.

The finite form of the verb p'ai (take) in the example has an edning (p'a-i) which indicates, among other things, the person and the number of its subject. In reported speech, however, (as the given example) this results in ambiguous sentences out of context. The ambiguity stems from two sources : First, the inflection of the dependent clause verb (p'a-i) marks 3rd person only and in reported speech could refer either to Mary or Anna as the subject. Thus, in Greek either "Mary could take Anna to the movies" or "Anna should take Mary to the movies", where in English only

Anna would be the subject of the non-finite dependent clause. Figure 3.4 represents the two possible interpretations resulting in Greek (verbal ambiguity) and Figure 3.5 shows the syntax and meaning allowed only in English.

Figure 3.4

	V1	V2
NP_1	X	X
NP_2		X

Figure 3.5

	V1	V2
NP_1	X	
NP_2		X

Second, the pronoun tin (her) appearing in the finite dependent clause (as the example shows) could refer in reported speech either to NP_1 (Mary) or to NP_2 (Anna) as the subject of the sentence (in the way shown in translation), or to another person not mentioned in the sentence. Ambiguous examples of pronominal reference occur in English : "Knowing that John had won the race surprised him" where him refers to John or someone else. The implied third person tin (her) could be the direct object of the finite dependent clause verb (p'a i =take) when NP_1 or NP_2 are the subjects. These ambiguities arise because anaphoric pronouns can refer back to persons or other noun phrases in other sentences which might form part of the total discourse.

The following interpretations of who is to go to the movies are possible :

NP_1 could take NP_2 to the movies;
NP_2 should take NP_1 to the movies;
NP_1 could take NP_3 (outside the sentence) to the movies;
NP_2 should take NP_3 (outside the sentence) to the movies.

Where NP_3 is possible, the term "exophoric reference" may be introduced.

The possibilities without exophoric reference which are indicated in Figure 3.4, arevery important for the description of the verb in both languages. The possibilities indicated in Figure 3.4 do not exist with verbs like ask, tell and promise in English. English verbs can be classified according to whether the subject in a following dependent clause is identical to the main clause subject or not. Tell is a verb where the subject

of a following dependent clause is always different from the subject of V1 (the main verb). So tell can always be associated with Figure 3.5. Promise is a verb which can always be associated with Figure 3.2 (identical with Figure 3.1). Palmer (1965, 1974) uses this formal characteristic of English verbs in a classification of "catenatives" He also notes that the formally identifiable subclasses, of which promise, ask and tell are members, have common semantic characteristics. They are all reporting verbs or verbs to do with planning. Longacre (1970) follows Palmer in his classification of such verbs.

The fact that either the Figure 3.2 relationship or the Figure 3.5 relationship, or even the Figure 3.4 relationship is possible in Greek rules out subclassification according to formal criteria. (All, except rot'o 'ask' belong to a formal class, given that they can be followed by na and the subjunctive, but further subclassification is not possible as in English.

Since the relationships that occur when promise is used are relatively infrequent in English (Figure 3.2 relationships), Rosenbaum (1968) has a special role to cases where the second NP is given the subject of the dependent clause verb. That is, in Figure 3.5, the second noun phrase goes with the second verb. Both are nearer to each other in the sentence than is possible when NP1 goes with V2. Rosenbaum proposes for syntax the "minimal distance principle"according to which, closeness of elements of the sentence which are in underlying structure relationships is given a higher value than distance. So constructions with promise, according to the "minimal distance principle", are more complex than those with tell, since the unstated subjects of the second verb is far from that verb.

The existence of verbal ambiguity in Greek, where either NP1 or NP2 could be the unstated subject of the dependent clause, must raise doubts about the universality of Rosenbaum's principle.

Besides verbal ambiguity there is in Greek another type of ambiguity, nominal ambiguity (cf. Chomsky 1957, Lyons 1968, Jacobs and Rosenbaum 1968), which works in the same way as nominal ambiguity in English. The sentence -

to dh'oro tu J'anni 'itan pol'i or'eo
(art.) (gift) (art.) (John) (was)(very) (nice)

could mean both in Greek and in English : "The gift John gave to someone was very nice" or "the gift John was given (by someone) was very nice." The ambiguity results when the nominal expression dh'oro (gift) is combined with the NP (John) appearing on the surface structure of the sentence. Active meaning results in assigning the NP (John) to the sentence as the subject, and passive meaning when the NP (John) is acted upon by someone else implied (out of context) as the subject. Both nominal ambiguity and verbal ambiguity are cases of underlying structure ambiguity. In both cases neither the meaning of the words changes (as in lexical ambiguity) nor the grouping of the words according to the linguists who distinguish deep and surface structure.

As has already been pointed out verbal ambiguity is a particular characteristic of Greek and results from the use of the finite dependent clause combined with the main verb of the sentence.

A pilot study on underlying structure ambiguity (nominal and verbal) with bilinguals :

Results from developmental studies are conflicting as to what extent children in the age range 6 to 12 (Kessel 1970) and as old as 15 (Shultz and Pilon 1973) could appreciate ambiguity (surface and underlying structure ambiguity). With the extra case of underlying structure ambiguity occurring in Greek (verbal ambiguity), it was thought important to test appreciation of that kind of ambiguity. The possibilities seemed more extensive than in the English studies. A pilot experiment was conducted using Greek speaking children in London. These children were bilingual, so checking the results by testing monoglot children in Greece was envisaged. Most ideas about bilingualism would imply that there would be some differences in bilinguals.

Subjects

The sample consisted of 49 bilinguals. They were pupils at Saint Sophia School, Montmouth and Inverness Terrace, London, where they attended courses in Greek, once a week, organized by the Greek Ministry of Education. The children came from homes where Greek was spoken. Their parents came from different parts of the Greek speaking world, but Greek-Cypriots were slightly better represented than the others. They fell into the following age groups :

		Age groups :			
		5,6,7+	8,9,10+	11,12,13+	
Sex:	Boys	6	5	6	
	Girls	10	12	10	
		16	17	16	/49

Linguistic constructions tested :

The linguistic constructions tested were all constructions which concerned ambiguity. The type of ambiguity was underlying structure ambiguity of the nominal and verbal form.

Examples of nominal ambiguity included the sentences :

tu J'anni to dh'oro 'itan pol'i or eo
(art.) (John) (art.) (gift) (was) (very) (nice)
the gift John gave someone was very nice
the gift John was given (by someone) was very nice.

and I ep'iskepsi tu th'iu 'itan pol'i efx'aristi s'imera
(art.) (visiting) (art.) (uncle) (was) (very) (pleasant) (today)
the uncle pleased someone visiting him
the uncle was pleased by someone's visit

The comprehension problem for the children was to decide whether the agent for the action described in the ambiguous sentences was the noun phrase having a genitive case ending (tu J'ann-i and th'i-u), or, whether there was an unstated subject if the genitive was objective. The second aim was to see if the bilinguals would allow both possible meanings implied by the nominal ambiguous sentences.

The second part of the pilot study concerned verbal ambiguity (underlying structure ambiguity). The main verbs which introduced the verbal construction were : Zit'o - 'request', prot'ino, 'suggest, propose', p'itho, 'persuade', simon'o, 'agree' and ip'osxome, 'promise'.

The kinds of construction in which all four main verbs can stand include :

NP1 + main verb + NP2 + na + V subjunctive.

In all these cases the main verb does not determine which NP from the main clause will be the dependent clause subject. The situation is as depicted in Figure 3.4.

Because the pronouns tu (his) tin (her) were included in the dependentent clause a reference to someone else, who could come from the total discourse, was possible (exophoric reference).

So more than two possible meanings could be assigned to the construction. This kind of ambiguity occurred in the sentence with z'itise 'asked, requested', concerning who should take whom to the pictures. There was one sentence with each main verb in the main part of the test, but five other sentences with each main verb were used in the preamble before the picture selection test.

Materials

The task was a picture selection task. The pictures used in the study were like those given in Appendix B but slightly bigger in size (9 x 11 inch coloured drawings). There were separate pictures of the individual characters with consistent colouring.

An implied character was also presented with the others mentioned in the sentence when ambiguity of exophoric reference was tested.

Each testing session was recorded with an ITT cassette recorder.

Procedures

The test was individual. It took place at a comfortable, well heated room at Saint Sophia School near to the children's classrooms. The child and experimenter were seated side by side, facing a table where the test was administered. The testing period lasted about thirty minutes for each child. It consisted of two parts. The first part included two measures of linguistic performance to check on the children's bilingualism. Each child had to comprehend a Greek story in its entirety which was presented to him orally. Then he had to continue the story for two minutes, maintaining relevance to the events already describe. The Greek story was as follows :

> Mary got up late to day. It was nine o'clock when she got up.
> Mother told her that she would be very late at school.
> She dressed quickly; she drunk a glass of milk only and
> ran to the school.

After comprehension of the story had been checked the child was asked to continue the story by giving what he thought Mary's activities could be at school. The answers were recorded and the number of relevant sentences and average sentence length were calculated .

The basic aim of this test was to see whether the child could follow the communication demands of the experimental procedures, and whether comprehension and fluency could be related to his performance in any way.

The other test of secondary importance was a word-association test. The children were given the word "school" and were asked to give, for one minute, as many words as they could think of after hearing this word. Their responses were recorded and the number of words given was calculated.

The word-association task had the same aim as they comprehension and completion story task.

The main test

The second part of the test, (the main test) itself consisted of two parts. The first part was a preamble with oral presentation of nominal unambiguous and ambiguous constructions similar to those which constituted the main test, when nominal ambiguity was tested first. The purpose was to check upon the bilinguals' Greek competence by "parsing" the constructions informally.

When verbal ambiguity was tested first, similar verbal constructions (unambiguous and ambiguous) to those which were to be tested were administered to the child. The purpose here was to have a "warm-up" discussion to find out if the children understood crucial lexical items like the main verbs. Whether the test began with nominal or verbal constructions was varied unsystematically.

Instructions

The instructions given to the child for the main test were similar to those described in detail in Chapter 6. The child was told that he or she did very well on the tests of secondary importance, if the level of comprehension indicated that he or she could follow the experimental procedures.

Then the child was told that he or she would play with coloured pictures listening to short stories. The task was to decide which picture or pictures could go with which story, and the children were asked to try their best.

Biographical Information

After the child had finished with the main test was asked to give information about his own background and the extent to which he used Greek at home with his parents, siblings and Greek friends. The purpose of this part of the interview was to explore possible correlation between the extent of usage of Greek and performance in the test. A seven point rating scale for the extent of Greek usage was extracted from this information. The way ratings were assigned, and the frequency of the kinds of response are shown in Table 3.2.

Results

Table 3.3 shows how the interpretations assigned to the constructions change with the age of the subjects. Only the oldest subjects allowed a second possible meaning for constructions. The change with age is mainly due to the onset of ambiguity detection. Children who did not detect ambiguity seemed to have a mixture of preferences for one or other of the adult interpretations that were possible. In Table 3.4, the association between detecting ambiguity in verbal and nominal constructions is shown.

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TABLE 3.2

Ratings of the extent of Greek usage, based on categories of response to the biographical questions

Interaction with Parents	Interaction with Peers	Rating	Frequency
Parents use all Greek and children use all Greek	Mostly Greek	7	11
Parents use all Greek and so do children	Language switching	6	7
Parents use all Greek but children switch	Language switching	5	8
Parents use all Greek but children switch	English is used with friends and siblings	4	0
Parents and children switch languages	Mainly English	3	12
Parents and children switch languages	Only English	2	3
Parents switch but children use only English	English or sometimes switching	1	6
Now only English	Only English	0	2
	Obtained average in the sample :	4.17	Total: 49
	Standard deviation :	2.22	

TABLE 3.3

Results for individual constructions

Construction	Interpretation	Age groups [a]			Chi square for association with age (4 d.f.) (> 18.46 gives p < .001)
		5,6,7+	8,9,10+	11,12,13+	
To dh'oro tu J'anni (John's giving)	Subjective genitive	10	12	1	33.75
	Objective genitive	6	3	2	
	Ambiguous	0	1	13	
I ep'iskepsi tu th'iu (Uncle's visiting)	Subjective genitive	11	12	4	26.51
	Objective genitive	1	3	0	
	Ambiguous	0	1	12	
Zit'o + na (request)	NP1	9	8	6	20.16
	NP2	5	5	1	
	Ambiguous	0	0	9	
Prot'ino + na (suggest)	NP1	14	12	5	30.32
	NP2	2	4	0	
	Ambiguous	0	0	11	
P'itho + na (persuade)	NP1	7	4	0	22.63
	NP2	6	10	8	
	Ambiguous	0	0	8	
Simfon'o + na (agree)	NP1	13	14	5	28.22
	NP2	2	2	0	
	Ambiguous	0	0	11	
Ip'osxome + na (promise)	NP1	8	7	2	28.75
	NP2	8	9	3	
	Ambiguous	0	0	11	

[a] Where the numbers in the age groups vary, this is because some responses were hard to classify.

What is meant by "partial detection" is detection on one of the examples and not the other. For consistency with verbal ambiguity, only the main verbs zit'o 'request' and simfon'o 'agree' were considered, since there seemed to be problems in deciding whether the children really knew what the other verbs meant. The kind of association in Table 3.4 is one where detecting nominal ambiguity is a prerequisite for detecting verbal ambiguity. This inconsistency in appreciating the same kind of ambiguity, considering that both nominal and verbal ambiguity are cases of underlying structure ambiguity, runs counter to predictions from linguistics. Before considering further the implications of such an inconsistency, it was decided to see if the results could be replicated with monoglots, using a more standardized procedure.

An alternative way of looking at the data provided the results given in Table 3.5. Instead of looking at individual constructions, the performance of individual subjects was considered by counting the number of ambiguity detections, and by using a difference score to see if there was a bias for an NP2 interpretation in verbal constructions. Such a bias would be of interest in view of the results of English psycholinguistic studies. The difference between the number of NP2 interpretations and NP1 interpretations was calculated for each subject. If there was no preference the difference would be zero, as it mustbe where ambiguity is detected.

Other measures of linguistic performance were derived from the first part of each testing session where the children had to show satisfactory comprehension of a story before taking part in the experiment. They also completed the story themselves. The measures obtained from this part of the test are listed in the key to Table 3.5.

In Table 3.5, it can be seen that there was a very slight preference for one interpretation (NP1) over another, but there was no evidence for an overall syntactic strategy among subjects who did not detect ambiguity. This confirms the impression to be gathered from Table 3.3. The mean difference score was - 1.07

TABLE 3.4

Relation between detecting ambiguity in verbal and nominal constructions

Nominal Constructions:	Verbal Constructions: Consistent detection	Partial detection	Failure to detect	
Consistent detection	7	4	0	11
Partial detection	0	1	3	4
Failure to detect	0	0	34	34
	7	5	37	49 (Total)

Chi square = 46.89 d.f. = 4, $p < .001$

TABLE 3.5

Pilot experiment with bilinguals - Correlations between measures:

Variable :	1.	2.	3.	4.	5.	6.	7.	8.	9.
1.	1.00								
2.	.21	1.00							
3.	.71	.17	1.00						
4.	.49	.12	.61	1.00					
5.	.17	.32	.36	.36	1.00				
6.	.47	.13	.43	.34	.10	1.00			
7.	.00	.00	.04	.00	.38	.22	1.00		
8.	.58	.17	.45	.47	.25	.85	.18	1.00	
9.	.00	-.14	.00	-.17	-.16	.17	-.00	.20	1.00
Means :	1.28	-1.07	8.81	3.51	2.70	7.95	4.04	6.02	4.17
Standard Deviations :	2.47	1.98	2.52	2.67	0.56	8.26	1.56	7.95	2.22

Key

Variable 1 : Number of ambiguity detections (maximum = 7);

Variable 2 : Difference between the number of NP2 preferences and NP1 preferences (+5 would mean all NP2, -5 would mean all NP1 and 0 would mean that there was no particular bias);

Variable 3 : Age in years;

Variable 4 : Number of words given as associates to the word for "school";

Variable 5 : Number of correct answers to the story comprehension questions (maximum = 3);

Variable 6 : Number of sentences provided to complete the story;

Variable 7 : Average length of sentence (words) in story completions;

Variable 8 : Number of relevant and correct sentences completing the story;

Variable 9 : Rating of the extent of Greek usage.

and it did not correlate with age, so it could not be higher in the younger age groups.

What is most remarkable in Table 3.5 is the clear lack of correlation between the rating of Greek usage and doing well at detecting ambiguity, or even other measures of performance. Children clearly do show differences, but it all depends on age, as can be seen from the correlations in the third column of the correlation matrix. It appears that the longer these children use the language the better they become, independently of the circumstances of usage. They all receive the schooling on Saturday mornings, of course, and may be this keeps up the knowledge of Greek in spite of sometimes unfavourable home circumstances.

In later studies, the variety of constructions used meant that quantitative approaches to the data were abandoned in favour of qualitative ones. This was no disadvantage, since the total number of ambiguity detections correlated very highly with age, but, at the same time, the associations in Table 3.3 were very strong for individual constructions.

The high score, with the low variance, for the answers to the comprehension questions(variable 5) is because that part of the test was used as a screening procedure to ensure that the children tested were bilingual.

Further investigation of ambiguity appreciation

The way the bilinguals failed to understand the meaningsof reporting verbs could have led to underestimating their appreciation of ambiguity. It was later found out that ambiguity was not detected earlier, even when familiar main verbs were used. But a test of monoglots was neededand also a selection of vocabulary which would be within children's capabilities. Verbs like p'itho (persuade) and prot'ino (suggest)

seemed too unfamiliar. Further testing relied on the most frequent reporting verbs like rot'o 'ask question' and l'egho 'tell, say'.

The pilot experiment foreshadowed later discoveries in failing to indicate that the youngest children relied on primitive syntactic strategies. Syntactic strategies would not produce the results of Table 3.3. However, the procedures needed some standardization, although an informal picture interpretation tasks was judged satisfactory.

What was very clear was the psycholinguistic relevance of the linguistic differences between English and Greek. Even though claims for a "universal" syntactic principle (Rosenbaum 1968) had been made on the basis of what happens in English verbal constructions, important differences existed in the syntax of Greek. The existence of such differences would make it unlikely that Greek children would behave as English studies might lead the investigator to expect. Even bilingual children showed an absence of primitive syntactic strategies in spite of the behaviour of children of the same age in English studies.

CHAPTER FOUR

Among the kinds of constructions tested on English speaking children over the age of five (see Palermo and Molfese, 1972) only a few cases involve ambiguity appreciation. For example, underlying structure ambiguity is involved in sentences like "Visiting uncle can be nice". In this case, nominal ambiguity is involved. But since many verbal constructions are ambiguous in Greek, when the corresponding English constructions are unambiguous, it became necessary to find out what Greek monoglot children would do, and what to make of responses when ambiguity was not detected. Since ambiguity is so pervasive, it was questionable whether children would employ syntactic strategies in responding to a picture interpretation task, instead of responding in a way that took account of semantic differences. Investigators like Carol Chomsky (1969) think entirely in terms of syntax, even when dealing with constructions with verbs like promise. One group of theorists about semantics, theorists who invoke the speakers' intentions (cf. Chomsky, 1976, pp. 64 ff.), might prefer to re-interpret her results in semantic terms. Carol Chomsky found that constructions with promise were difficult, and even more difficult were constructions with ask like "Ask Mary what to do". Following Austin (1962) and Searle (1969) all her constructions are assertions, but they are assertions about other kinds of speech acts. Her promise constructions were reports of "commissives", in Austin's terminology, and the difficult ask construction was a report of a speech act whereby one person consulted another. More commonly ask is used in reporting requests for information. May be her results could be re-interpreted by saying that difficulty depended on the kind of speech act which the construction reported. Since this is a re-interpretation of her data, testing corresponding constructions in Greek could indicate which way of interpreting comprehension difficulties was superior. So an experiment was conducted with unambiguous constructions equivalent to those tested in English, but with the majority of constructions being ambiguous in conformity with a structural difference between English and Greek.

D. Method

The English investigations which prompted the questions about ambiguity appreciation in Greek all used a fairly limited number of sentences because obtaining subjects presented no special problem. However, this investigation had to rely on a test with a range of constructions since going back to the subjects with further items to test was not a realistic strategy. This approach had an advantage over doing many small experiments, in that it gave more information about the relations between difficult constructions.

Subjects

The sixty children tested on a variety of Greek ambiguous constructions were pupils at the experimental school in Thessaloniki, which is attached to the Education and Psychology department of Thessaloniki University. The school population is recruited so as to be a cross-section as regards family socio-economic status. Ten children were selected at random from six school classes as shown below :

		Mean Age						
		6;8	7;6	8;7	9;6	10;5	12;3	N
Sex :	Boys	5	5	5	5	5	10	35
	Girls	5	5	5	5	5	0	25
								60

It was not possible to get equal numbers of boys and girls in all age groups, but only the oldest children (students of secondary education) are an exception. The 11+ age range was omitted because testing in a pilot experiment suggested that younger children would be very resistant to ambiguity detection. It was therefore decided to expand the age range at the older end.

Linguistic Constructions Tested:

Greek has ambiguous constructions with nominal expressions which are very similar to what can happen in English. Ambiguity can arise if sentences contain derived nominals, or nominal expressions with genitives. The first part of the test consisted of three sentences which were ambiguous because of the way they incorporated such nominal expressions.

Ambiguous nominal expressions. A derived nominal like kinijit'o 'chasing' can give rise to ambiguity like an English literal translation for sentence 1 - "Chasing tired John". The second sentence contained a noun with a genitive case ending and with its definite article in the genitive case. The genitive could be taken as a subjective or objective genitive, like the modifier of the hunters in the well known English example the shooting of the hunters. A third sentence used to test the appreciation of nominal ambiguity contained the noun episk'epsis 'visiting', which is in a derivational relationship with the verb form 'to visit'. The noun occurred in a periphrastic expression which allowed two interpretations - one on which the subject of the sentence made visits, and one on which he received visits. The free translations given in Appendix A indicate the possible interpretations. Appendix A contains all the sentences used in the whole study. They are numbered from 1 to 78. The first 39 were used in the test of ambiguity appreciation. Where there is more than one interpretation of an ambiguous sentence, a translation corresponding to each interpretation is given. Translations are labelled with lower case letters, starting with "a". Unambiguous sentences have their translation lettered, because Appendix A serves as a guide to Appendix B. Appendix B contains the pictures presented along with the sentences. The numbers and letters on the pictures correspond with the numbers and letters in Appendix A. For example, the sentence number 2 has two interpretations represented by the translations 2a and 2b. The correct pictures in Appendix B for that sentence are labelled 2a and 2b.

Ambiguous verbal expressions. Most of the test concerned ambiguous verbal expresssions. The general class of verb used was the class corresponding to the kind of verb that has been tested in English. Besides having the formal distinguishing characteristic of being followed by a to-infinitive construction, English verbs like ask, promise and tell have much in common semantically. Palmer (1974) points out that verbs typically used with the to-infinitive construction are futurity verbs, that is, verbs concerning planning, and also reporting verbs. It is therefore easy to select the Greek counterparts apart from the translation equivalents of ask, promise and tell. It was thought important to include common verbs of the same class like simfon'o 'agree'. The verbs selected for testing were l'egho 'say, tell', rot'o 'ask, question', zit'o 'ask, request an action', simfon'o 'agree' and ip'osxome 'promise'.

The verbs with more inherent lexical content like zit'o 'ask, request an action' have more restrictions on the variety of constructions in which they can appear. Zit'o, simfon'o 'agree' and ip'osxome 'promise' are commonly followed by a dependent clause, which begins with the particle na, and has a subjunctive verb form. The most stereotyped of these verbs, l'egho, 'say, tell' can appear with the following dependent clauses :

na + $V_{subjunctive}$;

conjunctive + na + $V_{subjunctive}$;

conjunctive + tha + $V_{future\ indicative}$;

conjunctive + $V_{past\ indicative}$.

The term "conjunctive" is taken from Hornby (1974) to refer to forms like ti 'what', p'oso 'how much' and other forms which can occur as interrogatives in direct speech.

When these main verbs appear in the various constructions, a large number of interpretations are conceivable, but not all of them are regarded as possible by native speakers. To ensure reliability, it was decided to use a procedure like the one used for testing the children. Twenty two native speaking adults gave their interpretations of each sentence used in the test, considering the pictures which were in preparation for use with the children. Other sentences about which the adults did not agree were excluded from the materials. Twelve of the adults consulted were Greeks studying in England, and ten were residents of Thessaloniki.

After obtaining the adult's judgements, there were thirteen constructions consisting of a main verb introducing a dependent clause. The thirteen differed either according to which main verb was used, or according to which kind of dependent clause, or because of the kind of interpretation that was possible. The first part of the test concerned nominal ambiguity. The other parts of the test are divided according to which main verb is concerned. Among the verbal constructions there was one or more unambiguous sentence along with the ambiguous ones.

Part II. The second part of the test concerned constructions possible with rot'o 'ask, question'. The construction labelled ROT'O A is :

NP1 + r'otise 'asked' + NP2 + conjunctive + na + $V_{subjunctive}$.

Although rot'o is normally the word for requesting information when it stands in the ROT'O A construction such an interpretation is ruled out. The adult norm is to allow only one interpretation on which the main clause subject (NP1) asks the hearer for advice. This is clear in the translations. For example, the translation of sentence 4 has the main clause subject asking "what fruit to buy". So the subject of the dependent clause is identical with that of the main clause. The speaker (NP1) consults the hearer (NP2). ROT'O A will be referred to as ROT'O A (consulting). The construction L'EGHO A (advising) could be the construction reporting a response to a ROT'O A sentence.

The first ambiguous construction in Part II of the test is ROT'O B :

NP1 + r'otise 'asked' + NP2 + conjunctive + $V_{\text{past tense}}$

According to the adult norm, sentences with this construction can have NP2 as subject of the dependent clause. In this case the request is for information about the hearer's past action. The construction can be referred to as ROT'O B (requesting a report). If the first person mentioned in the sentence asked the hearer the question, he seems to want the hearer to imagine or guess what he (the speaker) did. The question does not seem to arise out of lack of knowledge, but seems to be a request for a display of knowledge by the hearer. This interpretation can be compared with L'EGHO B, where the hearer seems to be getting information about himself, or receiving a display of knowledge, rather than receiving information.

The other ambiguous construction in Part II is ROT'O C :

NP1 + r'otise 'asked' + NP2 + conjunctive + tha + V_{future}.

When NP1 is selected as subject of both clauses, the interpretation is that the speaker asked for advice, as with ROT'O A (consulting). If NP2 is the subject of the dependent clause, the speaker wanted to know about the hearer's intentions. Sentences 4 to 12 constitute Part II of the test.

Part III. The third part of the test consisted of sentences 13 to 24. The main verb was always 'ipe 'told'. L'EGHO A was the construction :

NP1 + 'ipe 'told' + NP2 + conjunctive + na + $V_{\text{subjunctive}}$.

Only one interpretation is possible. The speaker recommended a course of action for the hearer. May be he had been consulted with a question as would be reported with ROT'O A (consulting). This L'EGHO construction can be referred to as L'EGHO A (advising).

L'EGHO B was the construction

NP1 + 'ipe 'told' + NP2 + conjunctive + $V_{past\ tense}$.

L'EGHO B is ambiguous. If NP1 is subject of both clauses, the speaker described his own actions. If NP2 is subject of the dependent clause, the speaker guessed what the hearer did, or reminded him of what he did. L'EGHO B will be referred to as L'EGHO B (reporting) and L'EGHO B (displaying knowledge). L'EGHO C was the construction

NP1 " 'ipe 'told' + NP2 + conjunctive + tha + V_{future}.

This construction is also ambiguous. With the same subject for both clauses, the speaker stated his intention to do what is described in the dependent clause. His utterance could have been a response to a question reported by ROT'O C (asking about intentions). With NP2 as subject of the dependent clause, the hearer is the recipient of a suggestion or advice. L'EGHO C can be referred to as L'EGHO C (expressing intentions) or L'EGHO C (advising).

The last construction in PartIII is L'EGHO D

NP1 + 'ipe 'told' + NP2 + na + $V_{subjunctive}$

When NP2 is subject of the dependent clause, this construction is the one for a simple directive. It reports an imperative utterance, or may be a request for action worded some other way. But according to adult norms NP1 can be the subject of the dependent clause as well as the main clause. On this interpretation the speaker requested to be allowed to do what is described in the dependent clause. This is L'EGHO D (obtaining consent) and L'EGHO D (directive) will be the other interpretation. "Petitioning" would be too strong as a label, but the sense is slightly different from that of a simple request.

Part IV. Part IV of the test concerned the verbs zit'o 'ask, request an action' and simfon'o 'agree'. With both these verbs the dependent clause was one with na + a subjunctive verb form. What was special about Part IV of the test was the way adult interpretations would allow reference to unmentioned participants in whatever conversations or interactions were reported. This meant that for ZIT'O and SIMFON'O one sentence had four possible interpretations.

The construction ZIT'O was given the same interpretations by the adults as L'EGHO D - either "obtaining consent" (the speaker asking if he or she may do somthing), or,"requesting an action". What happens with Sentence 27, which has more than two interpretations is due to the presence of the pronominal form tin 'her' in the dependent clause. The pronoun may be anaphoric (referring to someone who was in the interaction described but not a speaker or specific addressee). Adults have to imagine a specific context in order to take advantage of the referential ambiguity, but for the children, a picture of a third character was presented along with the pictures for the interpretation of the sentence. The translations 27c and 27d in Appendix A name this third character, who was available if the exophoric interpretations would be entertained. The referential ambiguity does not affect whether the interpretation is "requesting an action" or "obtaining consent".

SIMFON'O allows interpretations where any kind of agreement is involved. The first person agrees or undertakes to do something, or, alterntively he can consent to an agreement whereby the hearer (NP2) may do something. For this construction reference can be made to SIMFON'O (giving an undertaking) and SIMFON'O (consenting).

In sentence 30, there was referential ambiguity as well as the ambiguity arising from the marking of categories in the verb form. The masculine genitive pronoun tu can refer outside the sentence making possible the translations 30c and 30 d, given the presentation of three characters.

Part V. The fifth and last part of the test concerned ip'osxome 'promise'. As with zit'o and simfon'o, the dependent clause began with na and had a subjunctive verb form. IP'OSXOME C was the construction which allowed two interpretations, the general case. If the speaker (NP1) is subject of the dependent clauses, then a promise is reported as in English. The speaker gives an undertaking that he will do the action of the dependent clause. But the other interpretation which works for sentences 37, 38, and 39 has NP2 as the subject of the dependent clause. Besides promising to do something, the promise can be to let the hearer (NP2) do what is described in the dependent clause. So IP'OSXOME C can be IP'OSXOME C (giving an undertaking) or IP'OSXOME C (guaranteeing consent).

By changing the content of the dependent clause, sentences can be produced which are not ambiguous. This is how the three sentences of IP'OSXOME A were produced, so that IP'OSXOME A (giving an undertaking) is the only possibility. Promises to help mother are more likely to be good resolutions than guarantees of consent. Thus it likewise it is possible to have sentences where only the guaranteeing of consent is the adult interpretation. This happens with IP'OSXOME B (guaranteeing consent).

For the five parts of the test, all sentences were composed of only eight or nine words. An attempt was made to keep vocabulary and the kind of situation described as familiar to children as possible. The different parts of the test were administered in two testing sessions, or (in the case of some young subjects who showed weariness) in three sessions.

The summary labels for the adult interpretations of the constructions are abbreviations of paraphrases of the way the adults described the meanings. The summary labels are given in Table 4.1. Table 4.2 gives the paraphrases. For full details of each construction it is necessary to consult Appendix A with Appendix B.

TABLE 4.1

Adult Interpretations of the Linguistic Constructions Tested

Construction	Dependent Clause	Subject assigned by Adults	
		NP1 (Speaker or Addresser	NP2 (Hearer or (addressee)
ROT'O A	conj. + na + $V_{subj.}$	Consulting	-
ROT'O B	conj. + V_{past}	Testing knowledge	Requesting a report
ROT'O C	conj. + tha + $V_{fut.}$	Consulting	Asking about intentions.
L'EGHO A	conj. + na + $V_{subj.}$	-	Advising
L'EGHO B	conj. + V_{past}	Reporting	Displaying knowledge
L'EGHO C	conj. + tha + $V_{fut.}$	Expressing intentions	Advising
L'EGHO D	na + $V_{subj.}$	Obtaining consent	Requesting an action
ZIT'O	"	Obtaining consent	Requesting an action
SIMFON'O	"	Giving an undertaking	Consenting
IP'OSXOME A	"	Giving an undertaking	-
IP'OSXOME B	"	-	Guaranteeing consent
IP'OSXOME C	"	Giving an undertaking	Guaranteeing consent

TABLE 4.2

Interpretations of the constructions assigned by adults

DEPENDENT CLAUSE		MAIN VERB				
Construction	Subject assigned	L'EGHO	ROT'O	ZIT'O	SIMFON'O	IP'OSXOME
Conjunctive + na + subjunctive	NP1		ask for advice, a suggestion, a recommendation A			
	NP2	advise, recommend, suggest an action for NP2 A				
Conjunctive + tha + future indicative	NP1	state an intention C	ask for advice, for a suggestion C			
	NP2	advice, recommend, suggest an action for NP2 C	ask for information about a future action C			
Conjunctive + past indicative	NP1	describe his own action	ask NP2 to guess or imagine what NP1 did B			
	NP2	guess or remind of and action performed by NP2	ask for information, report about NP2's action B			
na + subjunctive	NP1	request permission or consent D		request permission or consent	agree to carry out an action	promise to carry out an action AC
	NP2	request, order an action		request, order and action	agree to NP2 enjoying what the agreement includes	promise enjoyment of a privilege, grant permission or favour BC

Materials

In testing the linguistic constructions, presentation was oral, and the whole testing session was recorded using an ITT Cassette recorder. The basic task was a picture selection task. All the pictures used in the whole study are given in Appendix B. The pictures in the Appendix are photographed from original line drawings. In presentation, colours were used to make individual characters (J'annis etc.) easily identifiable. There were six sets of coloured drawings with the dimensions $8\frac{1}{2}$ by $10\frac{1}{2}$ inches. There was a picture which corresponded with each adult interpretation of a sentence, and always the same number of distractors as correct pictures. So for ambiguous sentences with the interpretations, there were four pictures, two of them being correct. In Appendix B the top left capital letter on each drawing (C or W) indicates whether the picture is a correct choice or wrong. (The pictures used in the test did not have any such marks on them).

Besides the pictures accompanying sentences, there were pictures of the individual characters on their own. The colours were consistent throughout the sets of pictures, and the picture of the individual characters reduced the burden of the names as much as possible, since they were given on the individual pictures.

The distractor pictures for unambiguous sentences were pictures of the wrong character performing the same action as the character of the correct picture.

For ambiguous sentences distractor pictures had the same characters shown, with similar accompaniments, as in the correct pictures but no action was being performed.

The pictures were the materials for the main test, but in warm-up discussions coloured pens, coloured counters, pencils, marbles and two toy clowns were used to check comprehension of the verbal concepts.

Procedures

The children were tested individually in a small room, seated next to the experimenter at a table. The test was divided into two sessions which took place on different days. Five young subjects who showed weariness had the test administered over three sessions.

One of the sessions began with a "warm-up" discussion of ambiguous nominal expressions to alert the child to what would happen. This lasted from four to five minutes. Then Parts I, II and III of the test were administered. The other session began with a warm-up discussion of the agreement concept to ensure that important features were comprehended. ThenPart IV of the te t was administered. A further warm-up discussion of promising came before administration of Part V, the last part, of the test. The warm-up discussions of agreement and promising each lasted three to four minutes. In the main parts of the test, about one and a half minutes were spent on each sentence, although timing was not strict. Both testing sessions lasted about half an hour. Within each age group, half of the children received Parts IV and V of the test in their first testing session, and the other half of the children began with Parts I, II and III.

Warm-up discussion of nominal expressions. The warm-up discussion of nominal expressions was an entirely verbal affair. The course of the interview can be indicated as follows :

EXPERIMENTER	CHILD
If I say to you "John always remembered his father's advice", what do you understand? What does "his father's advice" mean?	
	. . .
If you hear the following sentence: "Cleaning the house was a very easy job for Helen", what did Helen do?	
	. . .

EXPERIMENTER	CHILD
If I say to you: "Kostas/Helen always had in mind the love of his mother", what does it mean? Who loved whom?	
	. . .
Some children are playing in the school yard. John and Peter started fighting. Now, if you hear the sentence, "John's punching was very hard", what do you understand? Who punched whom?	
	. . .
If I say to you the sentence, "The car's movement was very fast", what do you think of?	
	. . .
If you hear the following sentence, "The bird's flight was very low", what does it mean to you? What did the birds do?	
	. . .

It must be said that the nominal expressions in Greek, which are very commonly used in everyday speech and conversations seem much more natural than their free or literal translations in English. Some of the English investigations of nominal expressions have tended to use rather unnatural sentences. Which proper noun appeared in a sentence (Kostas or Helen) depended on the child's sex, and the order in which questions were asked varied considerably also.

Warm-up discussion before SIMFON'O 'agree' The course of the interview, In'which grasp of essential features of agreeing was checked, can be indicated as follows :-

EXPERIMENTER	CHILD
Suppose your brother/sister tells you to help him/her with homework, and you agree. What would you say to him/her? What would you do?	
	. . .
Suppose you agree with a friend of yours to play together. What would you say to him/her? What would you do?	
	. . .

EXPERIMENTER	CHILD
Two toy clowns are presented.	Child identifies the toys.
Here you have got two clowns.(E.adopts child's terminology). Suppose you agree to let me take one. What would you say? What would you do?	
	. . .
Coloured pens are given to the child.	
You have got all these pens. Suppose you agreed that I may have two. What do you say? What would you do?	
	. . .
Why did you give me the toy clowns? Why did you let me have the coloured pens?	
	. . .

The aim in this discussion was to check whether the children realised that agreement was mutually binding, and to check that they realized that a party to an agreement could be letting someone else do something, as well as undertaking to do something for him or herself.

Warm-up discussion before IP'OSXOME 'promise'. The course of the interview checking the children's notion of promising can be indicated as follows :

EXPERIMENTER	CHILD
Suppose you study hard, or if you are a good boy/girl and your father promises to buy you a new bicycle/dress. Can you tell me what you understand by this?	
	. . .
How do you promise your mother to be good at school?	
	. . .

EXPERIMENTER	CHILD
Coloured pens, counters, pencils and marbles are presented on the table.	
	Child identifies the objects.
Here you have got a lot of coloured pens and pencils. Suppose you promise to let me take some. How would you say that?	
	. . .
Why did you give me the coloured counters and marbles? Why did I get the pens and pencils?	
	. . .

The aim in this interview was to check whether the children thought that someone who makes a promise must either do something, or let another person do something, in accordance with the promise. All children performed satisfactorily in both parts of the warm up discussion.

The main test procedure. The parts of the main test each had the same main verb, eg l'egho 'say, tell', while the dependent clause construction varied. Within each part of the test, the sentences were presented in a random order, regardless of the kind of dependent clause, with the restriction that no more than two sentences with the same kind of dependent clause could follow each other. The course of the interview for each sentence can be indicated as follows :-

EXPERIMENTER	CHILD
After warm-up discussion where appropriate :	
You did very well. Now you are going to play another game, listening to some short stories and looking at some lovely coloured pictures . But first look at these two pictures.	
E. presents pictures of individual characters to be asked about, placing them to the left of the child.	
I am going to tell you some stories/sentences, one at a time, about these children. You will see them acting according to the story you are going to hear. Now look carefully at these pictures.	

EXPERIMENTER	CHILD
E. presents correct picture/pictures and the distractor/distractors in front of the child, keeping the individual character pictures in view.	
Do you recognize these characters? They are the same as the ones here on your left. Have a careful look at them.	
	Child scans pictures for 12 - 15 seconds.
E. delivers sentence orally, avoiding biased emphasis.	
You must choose between these pictures which picture/pictures you think tells the story or goes with the story you have just heard. What was the story you heard? Can you repeat it?	
	Child hears sentence till reception is satisfactory. Then chooses picture(s)
"Diagnostic" questions :	
Who asked whom? What did X ask Y? Who did that? How did X ask Y? Suppose you are X, how would you ask Y? Suppose you are Y, how would you ask X to do that?	

The term "sentence" was used for the older children. In the case of ambiguous sentences, there was more than one correct picture, and the number of distractors was always twice the number of correct pictures.

The questions asked after the picture choice were an attempt to see if the child could "parse" the test sentence informally, and may be supply the direct speech. If a correct picture was chosen, the experimenter asked why that picture had been chosen, and why the other picture or pictures did not fit the story.

Ambiguous sentences were sometimes presented again, later in the testing session, because of vacillation. The choice noted down was the child's final choice, although every interview was recorded with the cassette recorder.

E. Results

(a) Ambiguity appreciation

Eighteen subjects appreciated nominal ambiguity, but the responses of six were difficult to assess because of problems they had with interpreting the pictures. There were fewer problems in relating the pictures and sentences with verbal constructions. There was only one case for ROT'O B and for ROT'O C.

Verbal ambiguity was much more difficult. The number of successful subjects ranged from three in the case of ROT'O B to 7 for ZIT'O . With one exception, children detecting verbal ambiguity were over twelve-year-old. Four detected ambiguity on ROT'O B, five on ROT'O C, three on L'EGHO D, seven on ZIT'O, and on all other constructions there were six successful subjects. Table 4.3 compares data from this and other studies on nominal ambiguity appreciation. Raw proportions are shown since the numbers of subjects vary. Also in Table 4.3 the relation between appreciating nominal and verbal ambiguity is indicated. It is clear that consistent detection of nominal ambiguity is a prerequisite for even partial detection of verbal ambiguity. This result, with one exception, was obtained with 49 bilinguals in London, and it must be concluded that something more than purely linguistic knowledge may be involved.

Where children did not appreciate ambiguity, they often seemed to prefer one interpretation over another. With ambiguous constructions, their picture choices were the main source of information about these preferences. The picture choice data were given a detailed treatment.

TABLE 4.3

(b) Ambiguity appreciation data

Detection of nominal ambiguity - comparing other studies :

	Less than nine years	9 - 11 years	11 - 13 years	Adolescents
Kessel (1970)	24/32	14/17	1/1	-
Shultz & Pilon (1973)	0/28	3/28	17/28	20/28
This study (Greek monoglots)	1/27	8/18	9/9	-
Greek bilinguals	0/23	2/10	5/6	10/10

Note: The monoglot data is based on 54 subjects because of problems six of the children had with the pictures.

(c) Relation between detecting nominal ambiguity and verbal : (Chi square = 19.10, with 4 d.f., $p < .001$).

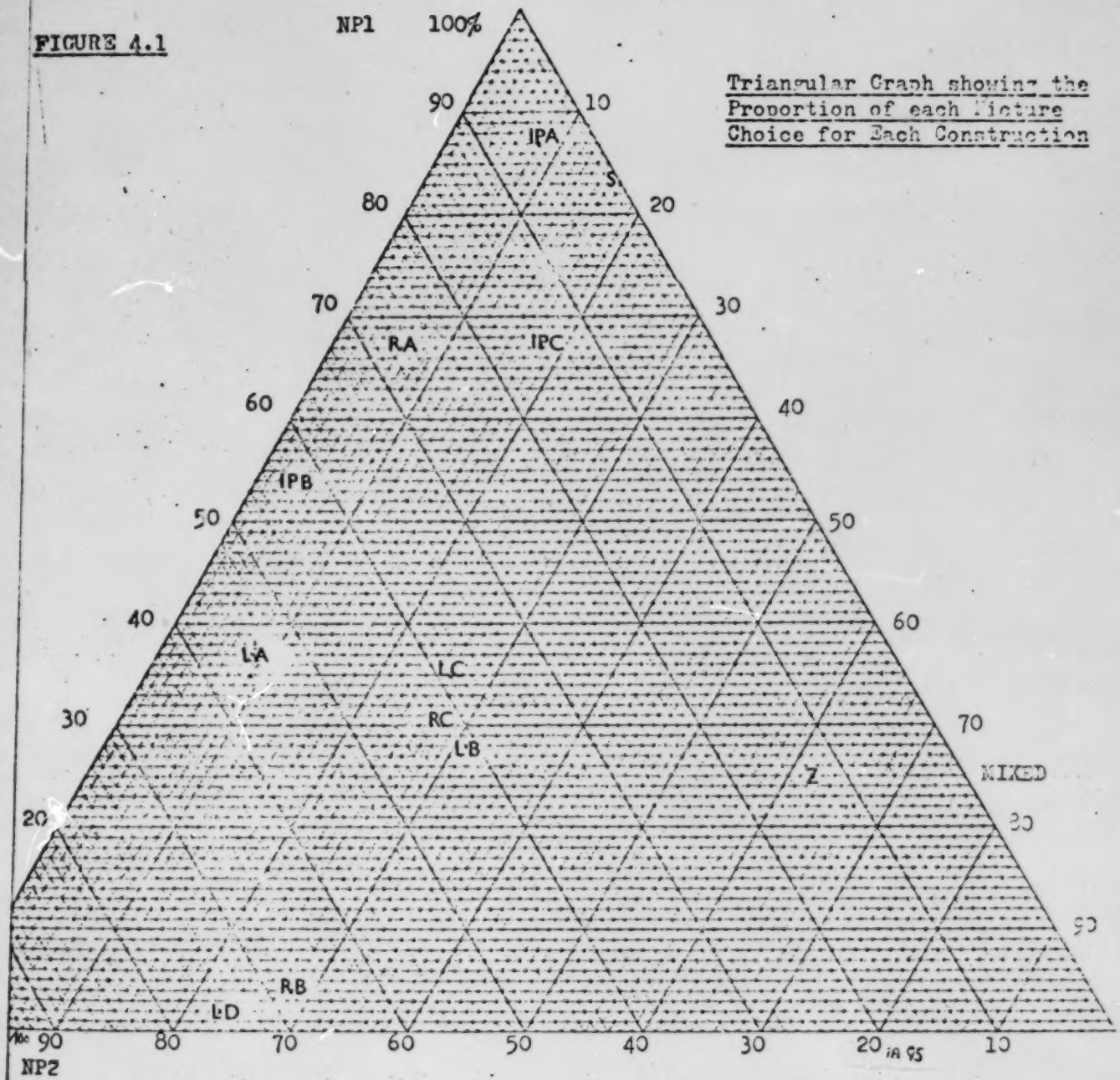
		Verbal Ambiguity : Consistent detection	Partial detection	Failure to detect	
Nominal Ambiguity :	Consistent detection	2	5	9	16
	Partial detection	0	0	2	2
	Failure to detect	0	0	36	36
		2	5	47	54

(d) Picture selection data

The picture selection data consisted of three kinds of response in the cases were ambiguity was not detected. A preference for NP1 occurred when all three sentences for a given construction were judged as having the same subject in the main clause and dependent clause. A NP2 preference occurred when a child took the nearest NP to be the subject of the dependent clause for all three sentences. Then there was the possibility that mixed responding could occur. Table 4.4 shows the frequency of the different kinds of response. Since the subjects are divided into three categories on each construction, it is possible to use the proportions to plot the constructions on a triangular graph (see Dickinson 1973, pp. 35-37). The proportions used for this plot ignored subjects who detected ambiguity. The plot of the constructions is shown as Figure 4.1. Constructions near the left side received few mixed responses, and those near the right-hand side received few NP2 responses. The ones near the bottom received few NP1 responses. The further they are to the middle of the graph, the less pronounced the preferences, and the more frequent are the mixed responses. What is clear from the plot is that there is no clear preference at all about L'EGHO C, ROT'O C and L'EGHO B. Where there seems to be a clear preference is with SIMFON'O which is treated as if it were SIMFON'O (giving an undertaking) exclusively, whereas to adults it can also be SIMFON'O (consenting). The preference for the "giving an undertaking" sense with IPOSXOME A accords with the only adult-like interpretation. ROT'O B and L'EGHO D are treated as ROT'O B (requesting a report) and L'EGHO D (requesting an action) exclusively, without consideration of other interpretations, although there is more mixed responding. Only in the case of ZIT'O there is a preference for mixed responding.

FIGURE 4.1

Triangular Graph showing the Proportion of each Picture Choice for Each Construction



Key

RA = ROT'O A (consulting)
RB = ROT'O B (testing knowledge/requesting a report)
RC = ROT'O C (consulting/asking about intentions)
LA = L'EGHO A (advising)
LC = L'EGHO C (expressing intentions/advising)
LD = L'EGHO D (obtaining consent/requesting an action)
Z = ZIT'O (obtaining consent/requesting an action)
S = SHIFON'O (giving an undertaking/consenting)
IPA = IP'OSXOME A (giving an undertaking)
IPB = IP'OSXOME B (guaranteeing consent)
IPC = IP'OSXOME C (giving an undertaking/guaranteeing consent)

Otherwise, sentences with a single construction seem to be treated as belonging together. Preferences where more than two-thirds of the children preferred one interpretation over the alternative occurred on SIMFON'O, IP'OSXOME C (both for NP1) and L'EGHO D and ROT'O B (both for NP2).

TABLE 4.4

(e) Picture choice data for all children except for the ambiguity detectors

Matrix of Phi coefficients for associations between performance on the different constructions :

	RB	RC	LB	LC	LD	Z	S	IPC	RA	LA	IPA	IPB
RB	1.0	.31	.32	.18	.23	.19	.20	.19	.23	.14	.18	.21
RC		1.0	.25	.34	.38	.20	.10	.15	.32	.24	.23	.19
LB			1.0	.51	.22	.32	.15	.28	.23	.21	.44	.34
LC				1.0	.34	.14	.01	.17	.27	.21	.29	.13
LD					1.0	.20	.01	.25	.25	.43	.15	.25
Z						1.0	.19	.23	.28	.15	.20	.30
S							1.0	.19	.12	.01	.28	.20
IPC								1.0	.39	.10	.51	.59
RA									1.0	.34	.38	.30
LA										1.0	.12	.21
IPA											1.0	.42

Note: Coefficients greater than .31 are significant at the 5% level.

(f) Frequencies of preferences for interpretations:

	RB	RC	LB	LC	LD	Z	S	IPC	RA	LA	IPA	IPB
NP1	3	16	15	19	2	13	45	36	40	22	52	31
NP2	40	23	22	21	43	7	0	5	16	33	3	26
Mixed	12	15	17	14	12	33	9	4	4	5	5	3
Total	55	54	54	54	57	53	54	54	60	60	60	60

(g) Chi square values for association with age :

RB	RC	LB	LC	LD	Z	S	IPC	RA	LA	IPA	IPB
10.13	4.14	8.09	3.81	9.11	4.76	4.61	7.80	11.56	10.02	20.20	3.52

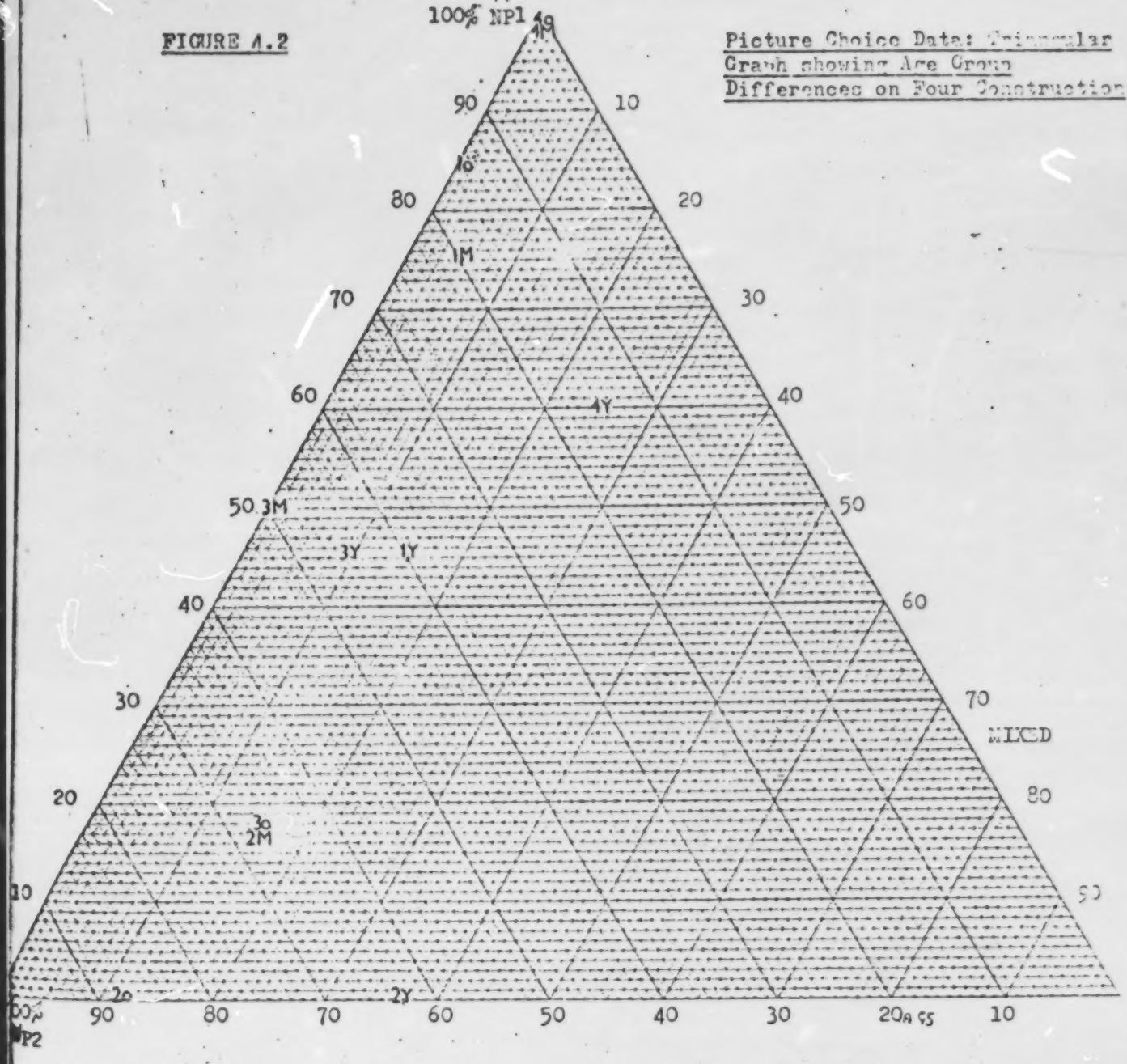
Note: Values greater than 9.49 are significant at the 5% level (d.f. = 4)

The Phi coefficients in Table 4.4 can be used to answer the question whether ambiguous constructions are treated like unambiguous ones by children who allow only one interpretation. This seems to be the case with IP'OSXOME C, since preferences are strongly associated with preferences on unambiguous constructions with the same main verb. Also association between ambiguous ROT'O C and unambiguous A is due to the same meaning (consulting) applied by the same children. But associations between ambiguous ROT'O B and L'EGHO B, and ROT'O C and L'EGHO C are mainly due to underspecialized meaning (question") which L'EGHO receives with the same kind of dependent clauses. Although there is a NPI preference for SIMFON'O as well as for IP'OSXOME constructions, the smallness of the Phi coefficient is due to different children making up the totals.

In Table 4.4, statistics for the association with age are given. With one exception, there is no significant association with age on ambiguous items among the subjects who do not detect ambiguity. ROT'O B is the exception. Table 4.5 shows the figures used for each age group in obtaining the Chi square statistics. The youngest, middle and oldest twenty children were compared. In the case of the exceptional ambiguous construction, a decline in mixed responding with age seems responsible for the significantly large statistic. In the other cases, there is a move to correct responding. A decline in mixed responding brought another ambiguous construction near to significance (L'EGHO D). This decline in mixed responses could be taken as behaviour consistent with treating ambiguous constructions like unambiguous ones. Figure 4.2 shows the constructionsthree times, once for each age group. Constructions where there was no significant association with age are omitted from Table 4.5. On the whole, there was an improvement in with age on unambiguous constructions, except for IP'OSXOME B (guaranteeing consent) where children wrongly treated it like IP'OSXOME A (giving an undertaking), irrespective of age.

FIGURE 4.2

Picture Choice Data: Triangular Graph showing Age Group Differences on Four Constructions



Key

1 = ROT'O A
2 = ROT'O B
3 = L'EGHC A
4 = IP'OSXOME A

Y = Youngest age groups (6+,7+)
M = Middle age groups (8+,9+)
o = oldest age groups (10+,12+)

TABLE 4.5

(h) Contingency tables where the association with age was significant :

Construction	Age Group	Picture Choices NP1	NP2	Mixed	N's	Chi Square	p
ROT'O B (ambiguous)	Youngest	0	12	7	19		
	Middle	3	13	3	20	10.13	$<.05$
	Oldest	0	15	2	17		
ROT'O A	Youngest	8	9	3	20		
	Middle	15	4	1	20	11.56	$<.05$
	Oldest	17	3	0	20		
L'EGHO A	Youngest	9	9	2	20		
	Middle	10	10	0	20	10.02	$<.05$
	Oldest	3	14	3	20		
IP'OSXOME A	Youngest	12	3	5	20		
	Middle	20	0	0	20	20.20	$<.001$
	Oldest	20	0	0	20		

(i) Adult-like responding

With unambiguous items, it was possible to evaluate the children's responses more rigorously than with ambiguous items. For every item, the children had been asked to provide the direct speech, if possible, and to informally "parse" the sentence, indicating what they thought the main verb meant. A criterion was applied on the unambiguous items to classify responses as "pass" or "fail". To pass, a child had to pick the correct picture, but also to justify the choice in the informal "parsing", and keep to an adult-like interpretation of the main verb. It was thought that insisting on correct conversion to direct speech as well was too strict, although sometimes direct speech was correctly provided. The advantage of applying the adult-like criterion, even though associations with age existed in the picture choices, lay in the examination of difficulty relations between constructions. From cross-tabulating the frequencies of success or failure on every pair of constructions, it was possible to construct a matrix of "disconfirmatory response patterns", using the approach advocated by Bart and Krus (1973). What was possible was an examination of whether success on any given construction was a prerequisite for success on another. The matrix of disconfirmatory response patterns, or exceptions to the prerequisite relation, enables a decision to be made about what sort of hierarchy of difficulty exists between the constructions.

Table 4.6 gives the matrix of exceptions to the prerequisite relation, the number of subjects who succeeded on the constructions when adult-like responding was the criterion, and the Cochran Q statistic for the significance of the order of difficulty of the constructions. With a significant Cochran Q there can be more confidence in the Bart and Krus methods, since they and Airasian et al. (1975) do not always agree on what proportion of exceptions to the prerequisite relation is tolerable.

TABLE 4.6

(j) Data from requiring adult-like responses on unambiguous items

Matrix of exceptions to the prerequisite relation for constructions considered in pairs:

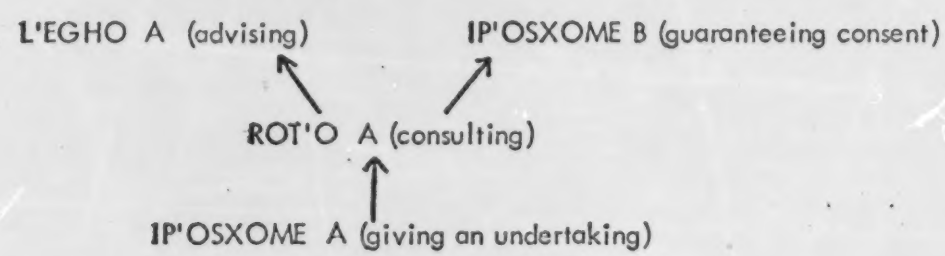
	LA	IPB	RA	IPA
LA	-	14	27	38
IPB	8	-	23	32
RA	1	3	-	13
IPA	0	0	1	-

(k) Numbers of subjects correct when adult-like responses are required:

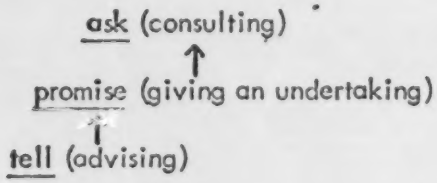
LA	IPB	RA	IPA
14	20	40	52

Cochran's Q for the related proportions = 63.37 $p < .001$

(l) From the matrix in Table 4.6 the hierarchy of difficulty can be diagrammed as follows :



What is remarkable about this hierarchy of difficulty is the way it contrasts with the one obtained by Carol Chomsky (1969). In hers there is a linear hierarchy as follows:



Although the numbers of successful subjects on this criterion are not very different from those with the correct picture choices in Table 4.4, this result would not have been found without the insistence on adult-like responding.

The main reason for failing to respond in an adult-like way seemed to lie in the children's ideas about what the main verbs could mean. Sometimes they applied non-standard meanings to the main verbs. The importance of non-standard meanings can be gathered from Table 4.7. In the case of IP'OSXOME B there was another reason for failure. The reason in that case was the application of the IP'OSXOME A meaning, which does not affect the main verb. In the case of ROT'O A "ask for a report" instead of "consulting" meaning was applied. For this reason failure with ROT'O A is classified under the label "Failure for other reasons" because the main verb preserves its question meaning unlike the other main verbs.

TABLE 4.7

(m) Analysis of failures to meet criterion :

Construction	Non-standard meanings	Failure with non-standard meaning			Failure for other reasons	Total failing
		NP1	NP2	Mixed meanings		
ROT'O A	-	0	0	0	20	20
L'EGHO A	* question	22	0	24	0	46
IP'OSXOME A	* tell-say	0	3	5	0	8
IP'OSXOME B	* tell-say	0	6	3	31	40

Note: Non-standard meanings are asterisked.

(n) Ambiguity appreciation and adult-like responding

Being correct on the unambiguous constructions and being correct about ambiguity (in appreciating its existence) are both forms of adult-like behaviour. The remaining relationship to be extracted from the data was between these two kinds of behaviour. The relationships suggest a more or less parallel development. The best 25 subjects were correct on either 3 or 4 of the unambiguous items, according to the adult-like responding criterion. No children detected verbal ambiguity with a score of less than 3, except for one child who realized that ZIT'O was ambiguous. On the other hand, it was possible to detect nominal ambiguity with a score of only two. The figures are :

		Nominal ambiguity:	
		Detection	Fail to detect
Number of unambiguous items correct:	3 or 4	16	9
	less than 3	8	27

Furthermore, of the seven subjects who could detect verbal ambiguity (partially or consistently), five failed on L'EGHO A, the most difficult unambiguous construction, and one of these also failed on IP'OSXOME B, the second most difficult. So although ambiguity appreciation and correctness on unambiguous items are associated, progress in both seems to be in parallel, rather than within a single development where the one follows the other.

CONCLUSION

In deciding when children can appreciate nominal ambiguity, Kessel seems to be an odd man out. Looking at his procedures it is clear that his test was invalid. He used distractor pictures where irrelevant actions were being performed. Children could succeed by selecting a picture with a relevant action, whereas in this experiment the pictures were more alike, whether correct or incorrect.

The way reliable appreciation of nominal ambiguity seemed a prerequisite for any appreciation of verbal ambiguity was paralleled in the results from bilinguals (see Chapter 3). It seemed independent of linguistic experience, and further improvement in comprehending verbal constructions that were not ambiguous could take place even in ambiguity detectors. Natsopoulos (1976) argues that the transition to formal operational thinking is implicated in ambiguity appreciation. He points to similarities between the protocols of children in these linguistic tests and those of children in Inhelder and Piaget's (1958) cognitive tests. The problem for this account is the dissociation relation between behaviour with nominal and verbal ambiguity. Natsopoulos appeals to the Piagetian notion of a "décalage" to explain this.

Response patterns where ambiguity was not detected, and where it did not occur, could not be attributed to any syntactic bias. English studies would lead one to expect a bias for NP2 response in younger children, but that did not occur. With the unambiguous constructions, the differences in difficulty do follow semantic differences. Speech acts like consulting, guaranteeing permission and commissives are responded to in different ways. What appeal to some general semantic explanation cannot handle is the striking contrast between these difficulty relations and those in English studies. Further data with more common reporting verbs was needed.

CHAPTER FIVE

Results from testing constructions with a variety of main verbs were very different in Greek from what might have been expected on the basis of English studies. A major cognitive advance was implicated, when ambiguity appreciation was involved. One observation suggested caution. The main verbs in the constructions tested were liable to be interpreted in a non-standard way. Some kind of semantic explanation was preferable to one relying on syntactic principles.

It was decided to conduct a test using only the most common reporting verbs, L'EGHO 'say, tell' and ROT'O 'ask, question'. With only two main verbs a greater variety of following constructions could be tried. Natsopoulos (1976) classified the resulting adult interpretations according to the kind of speech act reported by the sentences. He compared criteria suggested by philosophers, sociologists and sociolinguists. Sometimes these criteria overlapped, but it should have been possible to see if reports of the most different speech acts differed most extensively.

A subsidiary purpose of this experiment was to check on the resistance of pre-adolescent children to allowing more than one interpretation for ambiguous verbal constructions. Ambiguous sentences were presented after a context had been provided. The context was intended to make it as clear as possible that more than one interpretation of the sentence was possible. If both interpretations were accessible to children, then ambiguity detection should have been facilitated.

D. Method

The methodological approach was to test comprehension of a large number of unambiguous sentences for each of a number of constructions, which can, in general, give rise to ambiguity. Unambiguous examples were used to see how firmly based preferences in interpretation might be. To answer questions about ambiguity appreciation itself, part of the test consisted of ambiguous sentences preceded by contexts which were intended to prompt ambiguity detection.

Subjects

The seventy subjects were recruited from two schools. One third came from the experimental school attached to the department of Education and Psychology at the University of Thessaloniki. The pupils in this school are selected to represent a cross-section as regards family socio-economic background. Two thirds came from the 37th primary school, Thessaloniki, which shares classes with the experimental school. The sample from the 37th primary school was selected to match the socio-economic status of the children from the experimental school. The oldest children were from the secondary department of the experimental school. The composition of the sample was as follows :

		Mean Age							
		6;9	7;6	8;6	9;6	10;5	11;4	12;7	N
Sex :	Boys	5	5	5	5	5	5	10	40
	Girls	5	5	5	5	5	5	0	30
									70

The last group consisted only of boys because to ensure equal numbers of girls from another school proved difficult due to lack of cooperation from officials.

Linguistic Constructions Tested

The comprehension test given to the children had three parts : Part I tested constructions with the verb rot'o 'ask, question'; Part II tested constructions with the verbs simfon'o 'agree' and zit'o 'ask, request an action'; Part III tested constructions with 'ipe 'said, told', a form from the paradigm of l'egho 'say, tell'.

Constructions with these verbs present a comprehension problem in Greek, as in English, because there is an unstated subject to decide about. What is different about Greek is that the main clause verb does not indicate which noun phrase in the main clause will be the subject of the dependent clause. In Chapter 4, it was reported that children as old as thirteen were unaware of the resulting ambiguity. Whereas adults would allow that both John and Mary can be the subject of ta'isi 'feed' in

o J'annis z'itise ap' ti M'eri na ta'isi ti gh'ata
(art.) (John) (asked) (prep.) (art.) (Mary) (part.) (feed) (art.) (cat)

children would allow only John or Mary but not both.

All the sentences in Part II of the test were ambiguous like the example given. The dependent clause began with na and the verb was in the subjunctive, after the main verbs simfon'o 'agree' and zit'o 'ask'. What was new in this test was that ambiguous sentences were preceded by a context. The context was intended to prompt detection of ambiguity. For the sentence reporting the request about feeding the cat, the context was :

Mary has got a lovely little cat. John loves the little cat very much. He wants either to feed the cat himself or to get Mary to do so, because he would like the little cat to be very happy.

All the sentences used in the test are given in Appendix A, along with the preceding contexts. Part II of the test consisted of sentences 55 to 60 inclusive (six sentences). There were ambiguous sentences in the other parts of the test.

The ambiguous sentences with rot'o ' ask, question' and !'egho 'say, tell' as the main verb had a different kind of dependent clause from the other ambiguous sentences. The dependent clause in those cases began with a conjunctive (a word like which) and had a future tense verb. These sentences were sentences 52 to 54 inclusive in Appendix A, and sentences 76 to 78.

The main verb rot'o 'ask, question' cannot be followed by a dependent clause with na and the subjunctive. The sentences in Part I of the test had dependent clauses representing what is possible after rot'o, namely :

conjunctive + na + subjunctive verb;
conjunctive + tha + indicative of future tense
conjunctive + indicative verb in various tenses (imperfective and simple past)

In the latter case another dependent clause with subjunctive often followed the first dependent clause as Appendix A shows. To find out how firmly based children's interpretations were, it was decided to select particular sentences for testing in which the content of the dependent clause caused adults to declare only one conceivable interpretation possible. That is to say, although the syntax of the sentence allows for more than one interpretation, the content of any one example might well rule out one of the noun phrases as a candidate for being the unstated subject of the dependent clause. If a question concerns enjoyment of an outing, it is the hearer of the question who went on the outing, despite what is allowed by the syntax of the reporting sentence in general. Just such sentences were composed for Parts I and III of the test. The unambiguous sentences in Part I were sentences 40 to 51 inclusive. The unambiguous sentences with l'egho 'say, tell' were sentences 61 to 75 inclusive.

The collocational possibilities with l'egho 'say, tell' are more numerous than with other reporting verbs. They include all the possibilities with rot'o 'ask, question' as well as dependent clauses beginning with na and having the verb in the subjunctive.

In referring to what the sentences exemplified, the main verb, with a letter after it, will be used. Sometimes the adult interpretation of the construction will be added to the label. Different identifying letters are used where particular interpretations occur.

Table 5.1 labels all the constructions used in the test, and Table 5.2 summarizes the adult paraphrases. To ensure reliability of interpretation twenty-two native speaking adults were consulted about the sentences used in the test. They were given the pictures to be used, as well as being asked for their judgements verbally. The term "consulting" summarizes any interpretation on which the main clause subject (NP1) is regarded as asking for advice or for suggestions about a contemplated course of action. Constructions with rot'o can be used to report such an utterance. Conversely, constructions with l'egho 'tell' can be used to report the giving of advice or instructions. Hence the summary label "advising". Sometimes when a future tense occurs in a construction with rot'o or l'egho, the meaning does not concern consultation and the giving of advice, but the exchange of information about intentions. This gives rise to the interpretations summarized as "expressing intentions" and "asking about intentions". Constructions with l'egho 'say, tell' or rot'o 'ask, question' and a past tense verb in the dependent clause can report exchanges of information about past actions. These interpretations are summarized as "requesting a report" and "giving a report". When the statement about past action has NP2 as the unstated subject, the sense is not quite that of "giving a report". Asking about NP2's past action is a request for a report, but the only way to ensure a construction with l'egho which has NP2 as the unstated subject, is to get the overtone of approval or disapproval. This happens in L'EGHO F where the interpretation is summarized as "passing comment".

TABLE 5.1

Adult Interpretations of the Linguistic Constructions Tested

Construction	Dependent Clause	Subject of Dependent Clause	
		NP1	NP2
ROT'O A'	conj. + na + $V_{subj.}$	Consulting	-
ROT'O D	conj. + V_{past}	-	Requesting a report
ROT'O E	conj. + complex dependent clause	Consulting, asking for permission	-
ROT'O F	conj. + tha + $V_{fut.}$	-	Asking about intentions
ROT'O G	conj. + tha + $V_{fut.}$	Consulting	-
ROT'O C'	conj. + tha + $V_{fut.}$	Consulting	Asking about intentions
ZIT'O A	na + $V_{subj.}$	Obtaining consent	Requesting an action
SIMFON'O A	na + $V_{subj.}$	Giving an undertaking	Consenting
L'EGHO A'	conj. + na + $V_{subj.}$	-	Advising
L'EGHO E	conj. + V_{past}	Reporting	-
L'EGHO F	conj. + V_{past}	-	Passing comment
L'EGHO G	conj. + tha + $V_{fut.}$	Expressing intentions	-
L'EGHO H	na + $V_{subj.}$	-	Requesting an action
L'EGHO I	na + $V_{subj.}$	Obtaining consent	-
L'EGHO C'	conj. + tha + $V_{fut.}$	Expressing intentions	Advising

TABLE 5.2

Interpretations of the constructions assigned by adults

DEPENDENT CLAUSE		MAIN VERB			
Construction	Subject assigned	L'EGHO	ROT'O	ZIT'O	SIMFON'O
Conjunctive + na + subjunctive	NP1		ask for advice, a suggestion, a recommendation A		
	NP2	advise, recommend suggest an action for NP2 A			
Conjunctive + tha + V future	NP1	state an intention CG	ask for advice or a suggestion CG		
	NP2	advice, recommend suggest an action for NP2	ask for information about a future action CF		
Conjunctive + V past	NP1	state feelings about own action, express personal state E			
	NP2		ask for information about NP2's past action D		
na + subjunctive	NP1			request permission A	agree and fulfil an action A
	NP2	request an action, order H		request an action, order A	agree to NP2's enjoyment of what the agreement includes A
Conjunctive + complex clause	NP1	request permission to do something as part of fulfilling an intention I	ask for advice or for advice with permission E		
	NP2				

Some of the constructions involve notions like permission, or letting the other person do something, and requests to be allowed to do things. Thus the adult interpretations of zit'o + na + V subjunctive and the same construction with l'egho can be summarized as "obtaining consent" because the main clause subject wants to be allowed to do something. Agreeing that the NP2 should do something is summarized with the label "consenting".

These summarizing labels were based on questioning the adults about what the sentences exemplifying the constructions meant. The basis is the same for the translations provided in Appendix A.

What was obtained by varying the content of dependent clauses, as, for example, forcing the NP2 interpretation with questions about enjoyment, was a test where children would have to switch between a NP1 interpretation and a NP2 interpretation to perform in an adult-like fashion. If they had overall biases, or strategies associated with partcular main verbs, then they would not be able to perform correctly by adult standards.

The length of the individual sentences varied between nine and sixteen words, but those with a complex dependent clause were longer (up to 20 words). The complex dependent clauses in the constructions ROT'O G and L'EGHO I were so because a further dependent clause was embedded in the one following the main verb. However, the vocabulary and the kind of situation described was kept as familiar to the children as possible.

Materials

In testing the linguistic constructions, presentation and responding were oral, and the whole test session was recorded on an ITT cassette recorder. The basic task was picture selection. All the pictures used in the whole study are given in Appendix B. The pictures in the appendix are photographs of original line drawings. In presentation, colours were used to make individual characters easily identifiable. In addition there were separate pictures of the individual characters with consistent colours, and the names written in large letters. There were six sets of $8\frac{1}{2} \times 10\frac{1}{2}$ inch coloured drawings. There was a picture which corresponded with each adult interpretation of a sentence (NP1 doing the action, or NP2), and always the same number of distractors. So for the ambiguous items there were two correct pictures and two distractors. In Appendix B, the top left capital letter on each picture ("C" or "W") indicates whether a picture is a correct choice or wrong. (The pictures used in the test did not have any such marks on them).

Besides the pictures used in the main test, two toy clowns and some coloured pens were used in a warm-up discussion.

The content of the distractor pictures is important. For unambiguous sentences, in the distractor pictures the wrong character was shown performing the same action as the actor in the correct picture. For ambiguous sentences distractor pictures had the same characters shown, with similar accompaniments, as in the correct picture, but no action was being performed.

Procedures

The children were tested individually in a small room, seated next to the experimenter at a table. The test was divided into two sessions which took place on different days. Four young subjects who showed weariness had the test administered in three sessions.

One of the sessions consisted of Part I, then a warm-up discussion of the notion of agreement, and finally Part II. This session lasted about thirty-five minutes. The other session consisted of Part III - all the constructions occurring with l'egho 'say, tell'. The session for Part III took about thirty minutes. About one and a half minutes were spent on each sentence, although the timing was not strict. A little more time was spent on the sentences with complex dependent clauses. Within each age group, half of the children received Part III of the test in their first testing session, and half began with Parts I and II.

Warm-up discussion of agreement. To make sure that the children had the necessary lexical knowledge for Part II of the test, there was a warm-up discussion of agreement. The course of the interview can be indicated as follows :

EXPERIMENTER	CHILD
Suppose your brother/sister tells you to help him/her with homework and you agree. What would you say to him/her? What would you do?	
	. . .
Suppose you agree with a friend of yours to play together? What would you say to him/her? What would you do?	
	. . .
Two toy clowns are presented.	Child identifies the toys
Here you have got two toy clowns. (E adopts child's terminology). Suppose you agree to me take one. What would you say? What would you do?	
	. . .

EXPERIMENTER	CHILD
Coloured pens are given to the child.	
You have got all these pens. Suppose you agree to let me have two. What do you say? What would you do?	
	. . .
Why did you give me the toy clowns? Why did you let me have the coloured pens?	

The aim in this discussion was to check whether the children realised that an agreement was mutually binding, and to check that they realised that a party to an agreement could be letting someone else do something, as well as undertaking to do something himself. All children performed satisfactorily in the warm up discussion.

Testing comprehension of the sentences. Parts I, II and III of the test were kept together in the order in which the sentences were tested, although the sentences within each part were presented in a random order, regardless of kind of dependent clause, with the restriction that no more than two sentences having the same kind of dependent clause could follow each other. The effect was a constant switching between sentences where NP1 should be chosen, and NP2 should be chosen. The course of the interview for each sentence can be indicated as follows :

EXPERIMENTER	CHILD
You are going to play a game, listening to some short stories and looking at some lovely coloured pictures. But first look at these two pictures.	
E. presents pictures of individual characters which are candidates for choice, placing to the left of the child.	
I am going to tell you some stories/sentences, one at a time, about these children. You will see them acting according to the story you are going to hear. Now look carefully at these pictures.	

EXPERIMENTER	CHILD
E. presents correct picture/pictures and the distractor/distractors in front of the child, keeping the individual character pictures in view.	
Do yourecognise these characters? They are the same as the ones here on your left. Have a careful look at them.	
	Child scans pictures for 12 - 15 seconds.
E. says the sentence, avoiding biased emphasis.	
You must choose between these pictures which picture/pictures you think tells the story you have just heard. What was the story you heard? Can you repeat it?	
	Child hears sentence till reception seems satisfactory. Then chooses picture(s)
"Diagnostic" questions : Who asked whom? What did X ask Y? Who did that? How did X ask Y? Suppose you are X how would you ask Y to do that? Suppose you are Y how would you ask X to do that?	

The term "sentence" was used for the older children. In the case of ambiguous sentences, there were two correct pictures and two distractors as well.

The questions asked after the picture choice were an attempt to see if the child could "parse" the test sentence informally, and may be supply the direct speech. If a correct picture was chosen, the experimenter asked why that picture had been chosen, and why the other picture or pictures did not fit the story. All sentences were presented only once, although some retesting had taken place in a previous investigation.

E. Results from testing ambiguous constructions :

Despite the use of contexts intended to draw attention to two possible interpretations of the ambiguous sentences, only four subjects showed any appreciation of ambiguity. Three showed partial detection of ambiguity on L'EGHO C', and one subject consistently detected ambiguity across the four ambiguous-constructions. The results from testing these constructions concern preferences for one interpretation over another, when ambiguity was not detected. When a large number of ambiguous constructions was tested in a previous experiment, it was found that children, who did not detect ambiguity, nevertheless treated ambiguous constructions somewhat differently from unambiguous ones. A possible exception was the verb for "promise", which was not tested on this occasion because it produced similar behaviour. On this occasion it was possible to find out if response preferences had some basis, because many unambiguous constructions were tested. The ambiguity detectors were among the best 20% of the sample, according to performance on unambiguous items. Since other subjects did just as well on unambiguous items without detecting ambiguity, their preferences could be compared with those who did not do so well. If high performance and particular preferences were associated, then there might be "better" and "worse" ways of failing to detect ambiguity. In Table 5.3 the relevant Chi square values are all insignificant. So, there are not preferences on ambiguous constructions which distinguish high scorers from others on the rest of the test.

TABLE 5.3

(a) Data for ambiguous constructions when ambiguity was not detected :

Matrix of Phi coefficients for associations between preferences :

	RC'	ZA	SA	LC'
ROT'O C'	1.0	.24	.28	.30
ZIT'O A		1.0	.22	.24
SIMFON'O A			1.0	.14
L'EGHO C'				1.0

Coefficients above .24 would be significant but Fleiss (1973) recommends ignoring those below .30.

Preferences:

NP1	42	31	53	36
NP2	16	9	2	10
Mixed	11	28	14	20

(b) Chi square values for association between preferences and age (d.f. = 4) :

RC'	ZA	SA	LC'
1.33	8.09	5.96	10.61
(N.S.)	(.05 < p < .10)	(N.S.)	(p < .05)

(c) Chi square values for association between preferences and high scoring (> 9) on unambiguous constructions (d.f. = 2) :

RC'	ZA	SA	LC'
1.24	3.64	0.79	1.08

(all N.S.)

On the other hand, ambiguous constructions can produce changes in preferences with age (L'EGHO C') and associations between prefererces on constructions with different main verbs (see Table 5.3). What happened with L'EGHO C' was a decline with age in the frequency of choosing the second noun phrase. But although good performance on unambiguous items is associated with age, the change in preferences is not connected with good performance. The answer to the questions raised by this construction were found in the protocols of the children. A common non-standard meaning assigned to L'EGHO was to treat it as introducing an indirect question. This explains the significant association with preferences for ROT'O C'. So the change with age bound up with misapprehensions about what the construction means. The importance of meanings assigned to the main verbs is stressed in the description of what happened

(d) Results from testing unambiguous constructions :

The results for unambiguous constructions are based on the requirement of adult-like responding. To meet this requirement, a child had to pick the correct picture, avoid giving non-standard meanings to the main verb and provide informally a kind of "parsing" of the sentence, saying who was the actor and who was acted upon. Sometimes conversions to direct speech were provided correctly. It was decided that requiring correct conversions to direct speech would be an excessive demand since the test concerned comprehension, rather than what could be expressed verbally.

Table 5.4 gives the Phi coefficients for associations between being correct on all pairs of constructions, and the number of children correct on each construction. The statistic for the difference between the numbers correct was highly significant. Also given are Chi square statistics for the association between adult-like performance and age. Where the statistic indicated a significant association, the association was between improvement and age without exception. It is clear that the easiest constructions were not so easy as to leave no room for improvement with age. The most difficult constructions were very difficult for this sample of children. But for the two most difficult constructions there was a significant trend towards a greater proportion of the oldest children being correct. For these age comparisons, the sample was divided into the youngest 20, the middle 30 and the oldest 20.

The average number of constructions correctly comprehended for the whole sample was 6.76 with a standard deviation of 2.12. The correlation between age in years and the total number of correct constructions was .62 ($p < .001$).

(e) Data from 70 children on unambiguous constructions :

	LA'	LF	RD	RF	RG	LE	LI	RA'	RE	LG	LH
L'EGHO A'	-	.25	.08	.24	.02	.29	.06	.08	.22	.32	.19
L'EGHO F		-	.12	.28	.10	.07	.03	.02	.02	.07	.05
ROT'O D			-	.19	.25	.17	.25	.22	.10	.04	.01
ROT'O F				-	.26	.00	.22	.13	.06	.07	.38
ROT'O G					-	.18	.08	.61	.47	.14	.18
L'EGHO E						-	.17	.36	.35	.49	.01
L'EGHO I							-	.24	.18	.18	.24
ROT'O A'								-	.63	.33	.16
ROT'O E									-	.33	.07
L'EGHO G										-	.07
L'EGHO H											-

Number of children correct :	20	22	41	43	43	44	45	52	52	52	59/70

Cochran's Q = 99.13, d.f. = 10, $p < .001$

	LA'	LF	RD	RF	RG	LE	LI	RA'	RE	LG	LH
Chi square for assoc. with age with 2 d.f.	7.93 (.02)	7.35 (.05)	2.01 (N.S)	11.37 (.01)	2.05 (N.S)	18.09 (.001)	4.00 (N.S)	11.81 (.01)	6.68 (.05)	13.73 (.01)	8.37 (.02)

Phi coefficients over .24 would be significant, but Fleiss (1973) recommends ignoring any less than .30. Behaviour from one construction to the other was reasonably predictable in the case of ROT'O A' and ROT'O E, and ROT'O G, between some L'EGHO constructions, and between constructions with the two main verbs. The coefficient of .32 in the top row does not mean the same as the others, since there behaviour on the two constructions was different. Further analysis relied on the ordering theory methods described by Airasian et al. (1975). The aim was to see what kind of hierarchy of difficulty might exist between the constructions. The information needed is the frequency of failure on one construction while passing on another. If very few (less than 10%) fail on one while passing on the other, then success on the first construction can be regarded as a prerequisite for success on the other. The relevant frequencies are given in Table 5.5 for all pairings of constructions. The table is read by entering, for example, at the L'EGHO G row and reading that only one person was an exception to the prerequisite relation as far as L'EGHO A' is concerned. Looking at the LG column, in the cell at the L'EGHO A' row, there are 32 exceptions to the prerequisite relation. So success on L'EGHO G is a prerequisite for success on L'EGHO A'. If the figure in the second cell considered had been very small, the two constructions would be equivalent in difficulty. The relations to be extracted can be summarized in Table 5.6. What is very clear is that there is no linear hierarchy of difficulty, or Guttman scale. The difficulty relations are very complicated. If only L'EGHO H, ROT'O D, L'EGHO F and L'EGHO A' had been considered, there would have been a misleading impression of a straightforward linear hierarchy. The same would apply if only ROT'O E, ROT'O A', L'EGHO F and L'EGHO A' had been considered. But with the number of constructions tested, it would be extremely difficult to diagram the observed relationships.

TABLE 5.5

(f) Matrix of exceptions to the prerequisite relation :

	LA'	LF	RD	RF	RG	LE	LI	RA'	RE	LG	LH
L'EGHO A'	-	12	28	27	31	27	33	36	28	32	40
L'EGHO F	10	-	26	25	31	29	31	36	36	36	41
ROT'O D	7	7	-	15	22	21	20	25	20	21	23
ROT'O F	4	4	13	-	21	17	21	22	21	19	18
ROT'O G	8	10	20	21	-	14	16	11	13	18	25
L'EGHO E	3	7	18	16	13	-	13	14	14	12	22
L'EGHO I	8	8	26	19	14	14	-	15	16	16	24
ROT'O A'	4	6	14	13	2	6	8	-	5	9	17
ROT'O E	4	6	9	12	4	6	9	5	-	9	16
L'EGHO G	1	7	10	10	9	4	10	9	9	-	16
L'EGHO H	1	4	5	2	9	7	10	10	9	9	-

When a matrix like the one in Table 5.5 is used for items that form a scale, there is an increase in the frequencies along the rows and a decrease in the frequencies down the columns, provided that the items are listed in order of difficulty. The constructions are in order of difficulty in Table 5.5 and the absence of a scale is obvious. Carol Chomsky (1972) talks of a Guttman scale with reference to only three constructions. It is clear that such claims are dangerous, if up to eleven constructions are considered. If only a few constructions, which were central to theoretical interests had been tested, there could have been an oversimplified view of the difficulty relationships.

The relations that can be extracted from Table 5.5 can be summarized in Table 5.6.

TABLE 5.6

(g) Relations between the constructions :

Relation:	Construction:	with	Constructions:
Prerequisite	L'EGHO H		LA', LF, RD, RF, LE
"	L'EGHO G		LA', LF, LE
"	ROT'O E		LA', LF, RG, LE
"	ROT'O A'		LA', LF, RG, LE
"	L'EGHO E		LA', LF
"	ROT'O F		LA', LF
"	ROT'O D		LA', LF
Equivalence:	ROT'O A'		ROT'O E

It might be objected that this way of treating the results concentrates on the relations between the constructions tested, and not on the individual subjects. But this is the emphasis that the data require. The alternative approach was adopted by Cromer (1970). He showed a change in age that consisted of abandoning a "primitive" strategy of responding in the same way to all the constructions tested. The children tested in this study did not behave in a way that would make such an analysis feasible. Only three children out of the seventy responded in the same way to all the unambiguous constructions. What was changing with age was not the kind of overall stategy, but something much more specific.

(h) Non-standard meanings applied to the main verbs

The question as to what was changing with age to bring about improvement had to be answered by reference to the protocols of the test interview. What happened to bring about the improvements in performance was the gradual disappearance of misapprehensions about the meanings of the main verbs. The majority of failures were due, in the case of L'EGHO constructions, to thinking that L'EGHO could introduce an indirect question. Another case where a non-standard meaning was applied was where L'EGHO was followed by na and a verb in the subjunctive. Sometimes children thought the main verb could still introduce a statement, even in that construction.

Table 5.7 shows how well the misapprehensions (by adult standards) account for failures on the L'EGHO constructions. Where failure for other reasons occurred, it was because the construction was treated as a statement about the wrong person.

In the case of ROT'O constructions, all the children knew it introduced indirect questions. Where failure occurred, it was mainly because the kind of question being described was incorrectly understood as to the actor performing the action, denoted by the dependent clause.

The reason why the data were as has been described lay in the failure of young children to realize what meaning a main verb gave to a construction, and what meaning it could take from the construction. It is not surprising, then, that very complicated difficulty relations could occur between constructions having the same main verbs.

TABLE 5.7

(I) Analysis of failures to meet criterion :

Construction	Non-standard meanings	Failures with non-standard meaning			Failure for other reasons	Totals failing
		NP1	NP2	Mixed meanings		
L'EGHO A'	*question	26	2	22	0	50
L'EGHO E	*question	0	10	16	0	26
L'EGHO F	*question	0	0	38	10	48
L'EGHO G	*question	0	10	6	2	18
L'EGHO H	*statement	6	0	5	11	11
L'EGHO I	*request and statement	0	8	17	0	25
ROT'O A'	-	0	0	0	18	18
ROT'O D	-	0	0	0	29	29
ROT'O E	-	0	0	0	18	18
ROT'O F	-	0	0	0	27	27
ROT'O G	-	0	0	0	27	27

Note: Non-standard meanings are asterisked.

CONCLUSION

Although Natsopoulos (1976) had a classification of the constructions tested in the experiment to see whether the kind of speech act reported was the basis for comprehension difficulties, the results suggested a more obvious explanation. When a verb like L'EGHO 'say, tell' stands in a construction which is used to report speech, its meaning becomes restricted in a particular way. It can only introduce statements or commands, whereas, when used parenthetically in direct speech, it has all the stereotypy of the English verb say. Children did not realise that it could not introduce a reported question. Likewise with ROT'O 'ask, question' only the most common meaning (requesting information) is considered. The effect of putting ROT'O in a construction so that it reports a consultation was not appreciated by the youngest children. What changes with age, then, in the case of unambiguous constructions, is a piecemeal growth of knowledge about the way reporting verbs give meaning to, and take meaning from the constructions in which they can stand. The fact that this knowledge is language-particular is hardly surprising since children make mistakes even till adolescence, if adult standards are applied.

As far as ambiguous constructions are concerned, the resistance to allowing more than one interpretation, in spite of a facilitating context, reinforces the contention of Natsopoulos (1976) that a cognitive development is implicated in ambiguity appreciation.

CHAPTER SIX

The experiments described in Chapter 4 and Chapter 5 provided a number of constructions which differed widely in difficulty for Greek monoglot children. It was easy to select a smaller number which spanned the difficulty range to do a test of bilinguals in order to see how they might differ.

A number of theorists working with very young bilingual children have tried to conceptualize what the bilingual's state of linguistic knowledge can be. The possibilities considered are that the bilingual has a separate rule system for each language or a rule system unlike the rule system of monoglots in either language. Most theorists would predict that there would be a qualitative difference between bilinguals and monoglots on a test of this nature, not just a slight decrement in the performance of bilinguals. Theorists affected by the behaviourism of the 1950's would expect the bilinguals to split into the categories, or vary between two extremes. There should be a subgroup of bilinguals who would behave as English studies would lead one to expect, or bilinguals showing a degree of "interference". In this test a preference for one kind of response would identify such bilinguals. Membership of such a subgroup, or higher interference, should be associated with a particular kind of exposure to the minority language. Bilinguals who would be vary like monoglots should have a different kind of background. These behaviourist influenced views are attacked by Diller (1970), but some of the theories which refer to "rule systems" are not very different in their predictions, except that the role of biolgraphical variables is minimized.

D. Method

In investigations with monoglot Greek children in Thessaloniki, a wide range of linguistic constructions had been used. For bilingual children, fewer constructions were tested, because it was necessary to get further information about their competence in Greek, and biographical information that would be of interest.

Subjects

There were forty-two children in the investigation with ages ranging from six to thirteen. They fell into four age groups as follows :

		Average age : 6;6	8;5	10;3	12;5	N
Sex:	Boys	1	3	5	6	/15
	Girls	7	8	9	3	/27
						42

The children all came from homes where Greek was spoken, but their regular schooling was entirely English. They attended courses organised by the Greek Ministry of Education, which were held in Saint Sophia School, Montmouth, and Inverness Terrace, London. These courses are a voluntary provision, to give some schooling in Greek, and they are held every Saturday morning. The teachers on the courses were asked to provide pupils who were fluent in Greek. The school receives children with different levels of ability. To ensure that the subjects really knew Greek, a screening test was used. The 42 subjects eventually used were children who, on the whole, heard both English and Greek at home. (Only four came from homes where interaction with parents was conducted consistently in Greek). Two thirds of the children used both English and Greek in interactions with peers, but 15 of the 42 used only English in peer interactions.

This information was gathered from a questionnaire conducted while the test was in progress. It can be summarized as follows :

Language used with Parents

	Parents and children use Greek only	Parents use only Greek ; children switch	Parents and children switch	Parents switch and children use only English	
Numbers :	4	6	25	5	/42

Language used with Peers

	English only	Switching with siblings and friends	Greek with siblings; English with friends	Greek only with friends	Others	
Numbers	15	17	4	3	3	/42

Of the others one switched languages at home, and used only Greek with friends; one used only English at home and switched languages with friends; the third used only Greek with peers.

There seemed to be poor association between choice of language with peers, and the language used with parents. The children who used only English with peers came from every category of parental language use. The same was true of the children who used both languages with peers.

Parental Background in Greece. The parents of the children came from different parts of the Greek speaking world as can be seen from the following table:

Parental Origins

	Both from mainland Greece	One Greek and one Cypriot	Both from Cyprus	One Greek and one English	
Number of children:	15	7	19	1	/42

There are many differences between Greek dialects, besides the existence of language varieties comparable to the diglossia situations discussed by Ferguson (1959). But the tests being used did not seem to involve problems attributable to language varieties, apart from the judgements about pronunciation and accent.

Linguistic Constructions Tested

The linguistic constructions tested were all constructions which had been tested before with monoglot Greek speaking children. They concerned the verbs l'egho 'say, tell', rot'o 'ask, question' and zit'o 'ask, request an action'. Before use with monoglots the adult interpretations of the instructions had been checked with twenty two native speakers, using the pictures for the test with children, and discussing them verbally.

The kinds of construction in which both rot'o and l'egho can stand include :

NP1 + main verb + NP2 + conjunctive + $V_{subjunctive}$

NP1 + main verb + NP2 + conjunctive + $V_{past\ indicative}$

The comprehension problem for the children was to decide who was the unstated subject of the dependent clause which began with the conjunctive (a word like pi'o 'which' or or p'oso 'how much'). On adult interpretations, when rot'o appears in the first construction, a sentence means that the NP1 person represented by NP1 asks for advice, suggestions or recommendations for his own action. The unstated subject is NP1 (the same as the main clause subject). In Appendix A there is a list of all the constructions tested in the whole study of which this investigation is a part. This construction where NP1 asks for advice is labelled ROT'O A or A' and the interpretation can be summarized as "consulting". The roles of NP1 and NP2 are the other way about in the same construction when the main verb is l'egho 'say, tell'. In that case NP1 gives advice, or recommends a course of action for NP2. This is L'EGHO A or A' (advising) in Appendix A.

When the verb of the dependent clause is a simple past indicative, the construction with rot'o 'ask, question' is an indirect question asked of NP2 about his or her past actions. The same construction with l'egho 'say, tell' is interpreted as NP1 giving information about his or her own past actions. These constructions can be referred to as ROT'O D (requesting a report) and L'EGHO E (giving a report).

With these particular constructions, there is a different identification of the unstated subject for each verb. However, this is only because the specific content of the dependent clause forces one choice rather than another. In the most general case, the choice of main verb does not determine which NP from the main clause will be the dependent clause subject. In general, there is the possibility of ambiguity. So the test of bilinguals included sentences like

o J'annis z'itise ap' ti M'eri na ta'isi ti gh'ata
(art.) (John) (asked) (prep.) (art.) (Mary) (part.) (feed) (art.) (cat)

which can be translated, according to the possibilities allowed by adults, either as "John asked Mary could he feed the cat", or, as "John asked Mary to feed the cat". There were three sentences for zit'o 'ask, request' with the dependent clause beginning with na and having the verb in the subjunctive. There were three sentences for the other constructions also. The interpretation where Mary is to feed the cat can be summarized as ZIT'O A (requesting an action). What is also possible is the interpretation on which John would like to feed the cat - ZIT'O A (obtaining consent). In a pilot experiment, bilinguals had been found very resistant to detecting ambiguity. So the ambiguous sentences were each preceded by a context intended to prompt ambiguity detection. For the example given, the context was :

> Mary has got a lovely little cat. John loves the cat very much.
> He wants either to feed the cat himself, or to get Mary to do so,
> because he would like the little cat to be very happy.

The verb l'egho 'say, tell' can be used before a dependent clause with na and the subjunctive also. There was also the construction L'EGHO H (requesting an action)

What these constructions provide, for testing bilinguals, is a variety of meanings to comprehend - giving and receiving advice, giving and receiving information, requests for action and consent - but also a test of a syntactic kind. The question is whether they will realise that the unstated subject of the dependent clause is sometimes NP1 and sometimes NP2, and if they realise this much, will their identifications be like those of monoglots.

The actual test sentences are to be found in Appendix A. Those for ROT'O A or A' (consulting) are sentences 4, 5 and 6; those for ROT'O D (requesting a report) are sentences 40, 41 and 42; those for L'EGHO A or A' (advising) are sentences 13, 14, and 15; those for L'EGHO E (reporting) are sentences 61, 62 and 63; those for L'EGHO H (requesting and action) are sentences 70, 71 and 72; finally, those for ZIT'O A are sentences 55, 56 and 57.

Materials

Every testing session was recorded in its entirety with an ITT cassette recorder. The basic task was a picture selection task. All the pictures used in the whole study are given in Appendix B. The pictures in the appendix are photographs of the original line drawings. In presentation, colours were used to make individual characters easily identifiable. In addition, there were separate pictures of the individual characters with consistent colouring, and the character's name written in large letters. There were sets of $8\frac{1}{2} \times 10\frac{1}{2}$ inch coloured drawings. There was a picture which corresponded with each adult interpretation of a sentence (NP1 doing the action, or NP2 doing the action). There were as many distractors as correct pictures. So for the ambiguous items there were two correct pictures and two distractors. In Appendix B, the top left capitol letter on each picture (C or W) indicates whether a picture is a correct choice or wrong. The pictures when used in the test did not have any such marks on them.

Procedures

The children were tested individually in a large bui comfortably heated room, seated next to the experimenter at a table.

The main test and other interviews were administered in three sessions. In one session subjects were given the screening test, and tested for comprehension of constructions with rot'o 'ask, question' and zit'o 'ask, request an action'. In another session subjects were tested on constructions with l'egho 'say, tell' and interviewed about their biographical details. In a third session, the subjects were given a reading test to record their pronunciation of both, English and Greek. Half the subjects were tested on the rot'o 'ask, question' and zit'o 'ask, request an action' constructions first, and half began with l'egho 'say, tell' constructions.

The screening test. To make sure the subjects really knew Greek well enough to take part, the first testing session began with a screening test. This was a comprehension test of a modified version of the Greek myth about Leto and Niobe. The entire procedure for the screening test was in Greek, and can be indicated as follows :

EXPERIMENTER	CHILD
Instructions.	
Now you are going to hear a short story in Greek, and then I shall ask you some easy questions about what the story was about. You must listen to the story carefully in order to give correct answers. Try your best. If you do well, you are going to play a game with me, listening to new stories and looking at lovely coloured pictures.	
E. tells the story at normal speech rate without repetitions.	
Once upon a time there was a queen by the name of Leto. She had two children, a boy	

EXPERIMENTER — CHILD

and a girl. Once, she and her children were walking in the countryside, and they met a very poor woman, whose name was Niobe. She had twelve children, six boys and six girls. When Niobe saw Leto's children, she laughed and made fun of her because she had only two children. The queen became angry and killed all the poor woman's children. Niobe cried without stopping for many days and nights. Her grief was unbearable. She prayed to God to transform her into a stone. It is said that tears still spring from this stone.

E. asks:

How many women were there in the story? — Child can score 2 points.

How many children did they have? — Child can score 2 points.

Why did Leto kill Niobe's children? — Child can score two points.

What happened to Niobe afterwards? — Child can score four points.

In order to proceed with the test, children had to score a total of five points.

Testing sentence comprehension in the main test. A quick check was made on whether the children understood the main verbs to be used by asking them to translate them into English. Otherwise the procedure was consistently all in Greek. The course of the interview for a sentence can be indicated as follows :-

EXPERIMENTER — CHILD

Now you are going to play another game, listening to some short stories and looking at some lovely coloured pictures. But first look at these pictures.

E. presents pictures of individual characters from the sentences, placing them to the left of the child.

I am going to tell you some stories/sentences, one at a time, about these children. You will see them acting according to the story you are going to hear. Now look carefully at these pictures.

EXPERIMENTER	CHILD
E. presents correct picture/pictures and the distractor/distractors in front of the child, keeping the individual character pictures in view.	
Do you recognise these characters? They are the same as the ones here on your left. Have a careful look at them.	Child scans pictures for 12 - 15 seconds.
E. says the sentence, avoiding biased emphasis.	
You must choose between these pictures which picture/pictures you think tells the story you have just heard. What was the story you heard? Can you repeat it?	Child hears sentence till reception seems satisfactory. Then chooses picture(s).
"Diagnostic" questions :	
Who asked whom? What did X ask Y? Who did that? How did X ask Y? Suppose you are X, how would you ask Y to do that?	

The term "sentence" was used for the older children. In the case of ambiguous sentences, there were two correct pictures, so there were two distractors.

The questions asked after the picture choice were an attempt to see if the child could "parse" the test sentence informally, and maybe supply the direct speech. If a correct picture was chosen, the experimenter asked why that picture had been chosen, and why the other picture or pictures did not fit the story. The part of the testing sessions, in which the sentence comprehension test occurred, lasted about twenty minutes. The other parts of the interviews made the whole session last about half an hour.

Biographical information. A short informal interview gave information about the subjects' backgrounds and the extent of their usage of Greek. The information collected concerned : the language spoken to the children by the parents, the language spoken to the parents by the children, the language used when speaking to siblings, and the language spoken when playing with friends and siblings. The interview also revealed from which part of the Greek speaking world the parents originated.

Reading test. Each child took a reading test in a separate interview session. The purpose of this test was not to find out about reading ability, but to get a sample of the child's speech to establish whether there was a "foreign accent". The passages read were from a school book in either language. Eight subjects were not very good at reading Greek text, so a sample of their speech was obtained by getting them to describe in Greek pictures from a Greek book. Six of the youngest subjects had trouble reading the English book so describing pictures from an English book provided a sample of their English.

Each child's sample of Greek was judged by four Greek native speakers - two from mainland Greece, and two Greek-Cyporiots. Two English native speakers judged the samples of the children's English. All judges worked entirely independently, and, since the task was a long one, received one pound for their efforts.

The Greek recordings were judged as "Greek", "Greek-Cypriot", "Mixed" or "Foreign". The English ones were judged as "English", "Mixed" or "Foreign". In making use of the judgements, the Greek and Greek-Cypriot judgements were combined as "Greek".

E. Results for primary measures

The main interest in testing the bilinguals was to see if they would behave in a different way from the monoglots. It is therefore best to present the data from the constructions tested, treating the bilingual group as a whole, before asking about within group differences. The results from the secondary measures (assessment of the extent to which they use Greek, and other biographical information) can follow, as they justify the comparison of the group as a whole with the monoglots. Data from seventy monoglots will be compared with the bilingual data throughout. The test of the monoglots is described in Chapter 5.

(a) Ambiguity appreciation

From a previous test of bilinguals, it did not seem likely that they would be any different from monoglots as far as ambiguity appreciation is concerned. When monoglots were aided in appreciating ambiguity by putting the sentences in a context which emphasized that more than one answer may be correct, there was little effect. The age at which ambiguity was appreciated did not seem to get influenced. The ambiguous construction tested on this group of bilinguals was ZIT'O A. None of them allowed more than one interpretation. This did not imply any inferiority at the task, since only 1 monoglot appreciated the ambiguity of that construction and the sample sizes differed. However, it was possible to compare the preferences for one interpretation over the other using the picture choice data.

(b) Picture choice data

In the case of an ambiguous construction, the picture choice data is the main method of deciding what the preferences for one interpretation over another might be. This is because it is difficult to decide what a "good" or "bad" response is by adult standards, since any refusal to admit an alternative interpretation is "bad". To see the ambiguous construction in relation to the unambiguous ones, the picture choice data for all the constructions tested on the bilinguals is given in Table 6.1, and the constructions are plotted on a triangular graph in Figure 6.1. Data for monoglots are also given.

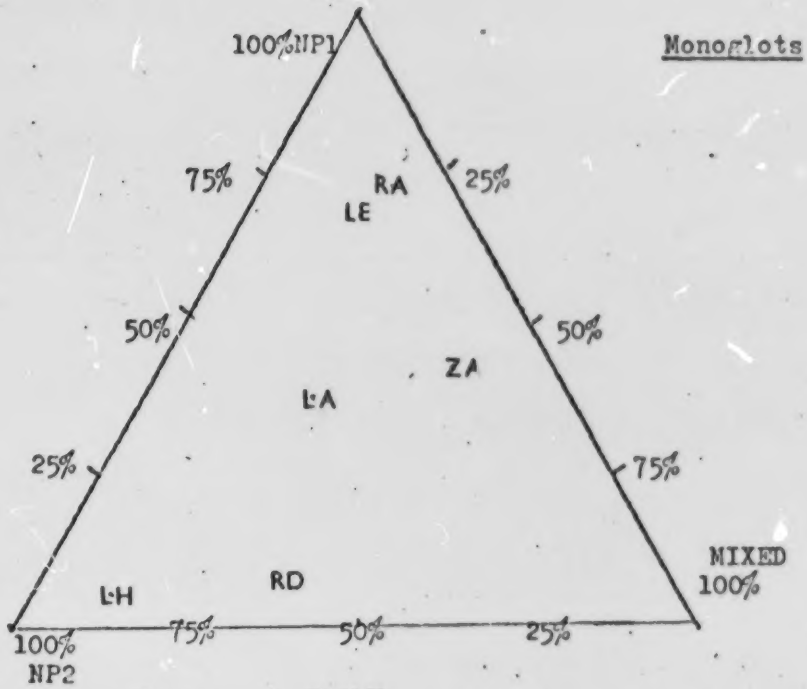
TABLE 6.1

Picture choice data for children who did not detect ambiguity

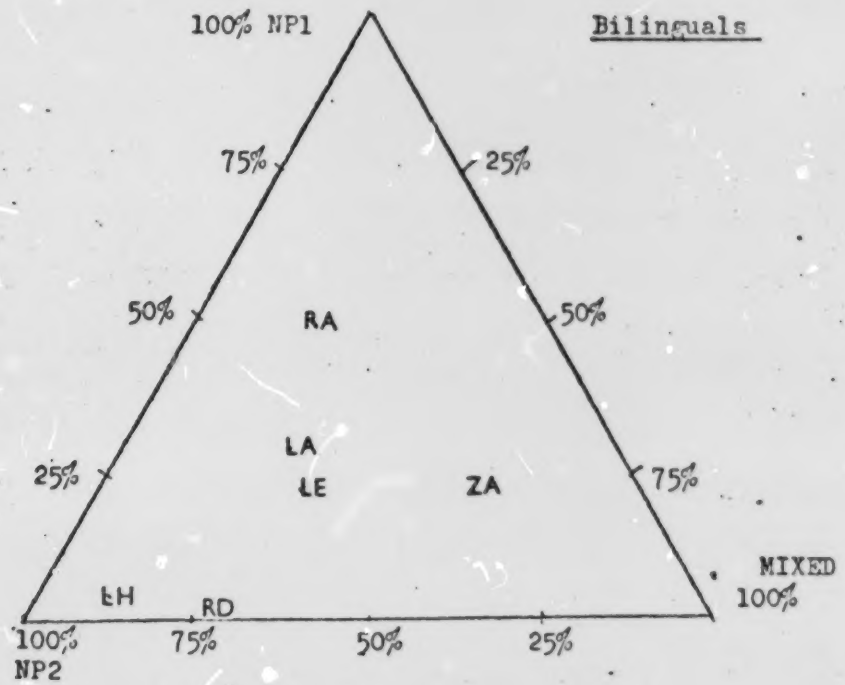
Construction	Response category (proportions in brackets)			
	NP1	NP2	Mixed	
ROT'O A'	52 (.74)	8 (.11)	10 (.14)	
ROT'O D	6 (.09)	41 (.58)	23 (.33)	
L'EGHO A'	26 (.37)	27 (.39)	17 (.24)	MONOGLOTS
L'EGHO E	47 (.67)	10 (.14)	13 (.19)	
L'EGHO H	6 (.09)	59 (.84)	5 (.07)	
ZIT'O A	31 (.46)	9 (.13)	28 (.41)	
ROT'O A'	21 (.50)	12 (.29)	9 (.21)	
ROT'O D	0 (0.0)	28 (.67)	14 (.33)	
L'EGHO A'	13 (.31)	19 (.45)	10 (.24)	BILINGUALS
L'EGHO E	8 (.19)	21 (.50)	13 (.31)	
L'EGHO H	1 (.02)	36 (.86)	5 (.12)	
ZIT'O A	12 (.28)	10 (.24)	20 (.48)	

FIGURE 6.1

Triangular Graphs Showing the Constructions according to Picture Choices



RA = LOT'O A' (consulting)
LA = L'EGHO A'(advising)
LE = L'EGHO E (giving a report)
LH = L'EGHO H (requesting an action)



From Figure 6.1 it seems that only two unambiguous constructions are treated differently by bilinguals and monoglots, and the ambiguous construction seems to be treated similarly. Breaking down the frequencies by age groups gives Figure 6.2, a triangular graph for the frequencies in Table 6.2, in the case of the ambiguous construction. For unambiguous constructions, age differences were looked at using the data for adult-like performance.

(c) TABLE 6.2

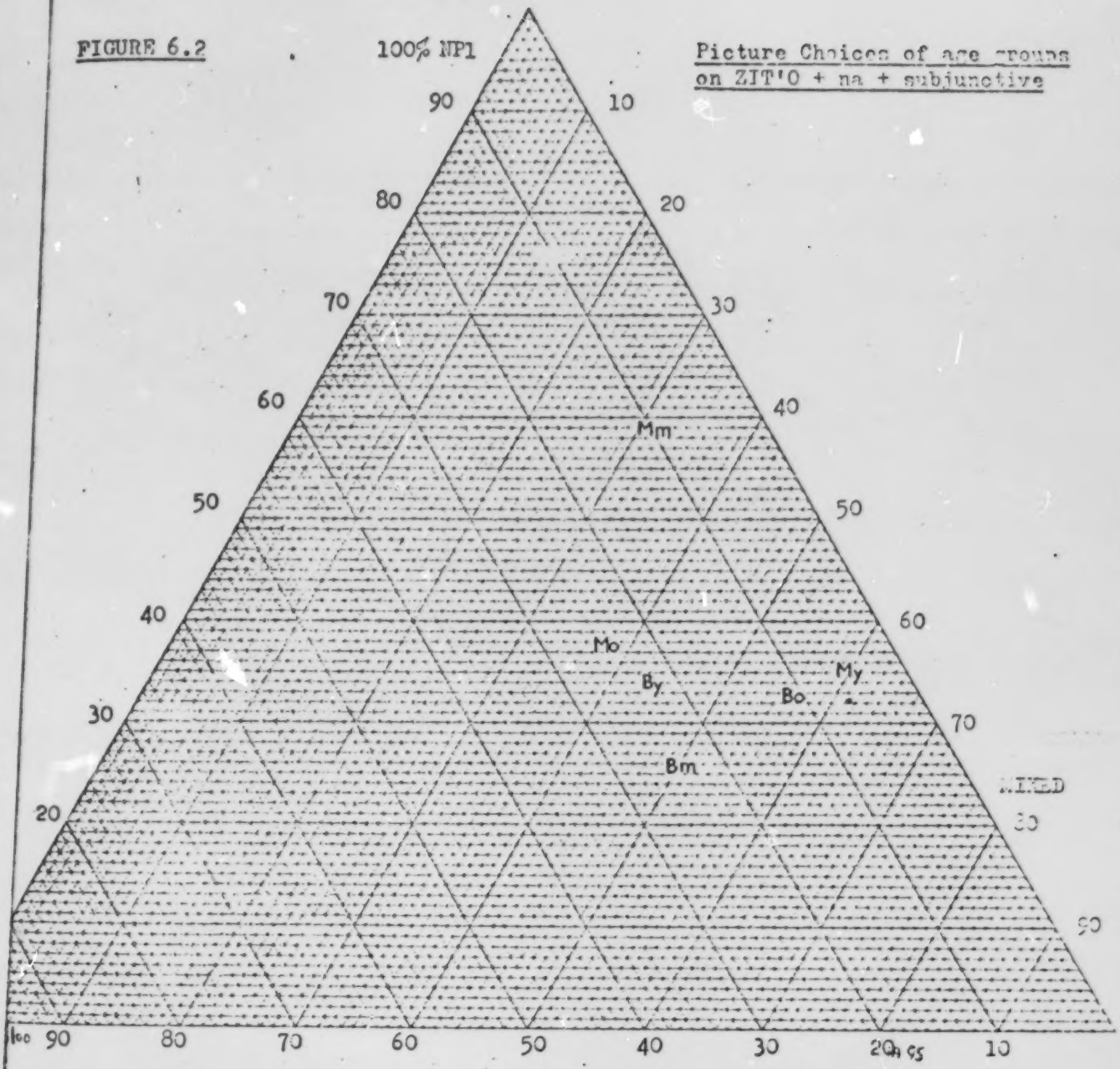
Picture choice data for ambiguous construction ZIT'O A

Age in years	Group	Category of response			Chi square	d.f.	P
		NP1	NP2	Mixed			
6+, 7+	Mono	7	1	12			
	Bi	3	2	4	1.89	2	N.S.
8+, 9+, 10+	Mono	17	3	9			
	Bi	6	6	12	6.46	2	$<.05$
11+, 12+	Mono	7	5	7			
	Bi	3	1	5	1.24	2	N.S.
					Sum = 9.59	6	N.S.

On ZIT'O A what happens among the monoglots is that the middle age group move towards a NP1 preference, the choice that adults would interpret as "obtaining consent", but in the oldest age group there is no clear preference for one interpretation or another. The oldest and youngest bilingual age group are not significantly different from the monoglots, but the middle group is more like the other two groups. Table 6.2 shows that too much must not be read into the difference in the middle age groups,

FIGURE 6.2

Picture Choices of age groups on ZIT'O + na + subjunctive



Key

M = monoglots
B = bilinguals

o = oldest children (11+)
m = middle age groups (8+,9+,10+)
y = youngest age groups (6+,7+)

because if all the Chi square values are added, as is possible with that statistic, the resulting value is 9.59 with 6 degrees of freedom (N.S.) (see Maxwell 1961, p. 75). The theorist who would predict a difference between bilinguals and monoglots on the basis of English studies would be excited by the resistance to a move in the direction of an NP1 preference in the middle age range. But the bilinguals do not show any tendency to favour NP2, and the overall difference is not significant.

(d) Adult-like performance

Where constructions were not ambiguous, it was possible to judge performance as adult-like or otherwise. To be judged as adult-like on a construction, a subject had to pick the correct picture for all three sentences exemplifying a given construction, even though they were separated in presentation. It was also necessary to informally "parse" the sentences so as to satisfy the experimenter that he or she knew who was the subject of the second verb. It was also necessary to convince the experimenter that a standard meaning was being assigned to the main verb. A correlation of .45 was obtained between age and the total number (out of five) of constructions where there was adult-like performance. Generally, there is an improvement with age. A correlation of .50 was obtained between age and performance on the same constructions with monoglots. The bilinguals were not as good as the monoglots overall - the median number of constructions correct is two, with an average of 2.29 for the bilinguals and three (average = 3.19) for the monoglots. The difference between the means is significant ($t = 4.28$ with 110 d.f.). Looking at the way age groups perform with respect to the appropriate means or medians, it is clear that a grouping of the first two, middle three and oldest two age groups can be used to make comparisons on individual constructions.

The way the two groups are distributed about their medians is as follows:

BILINGUALS

	6 or 7 years	8,9,10 years	11 years and older	
Number correct on more than the median or mean:	1	8	6	
At or below median:	8	16	3	
Totals:	9	24	9	/42

MONOGLOTS

	6 or 7 years	8,9,10 years	11 years and older	
Number correct on more than the median or mean:	3	9	14	
At or below median:	17	21	6	
Totals:	20	30	20	/70

What is really of interest is not so much the fact that the bilinguals are slightly worse overall, but whether there is anything different about their pattern of results. Some overall decrement is to be expected since their week-day education is entirely English, and the biographical information shows that English is very much their language, more so than Greek.

(e) Comparison of bilinguals and monoglots on individual constructions.

The question arises, given an overall improvement in age in both groups, whether the same constructions are found difficult in each group, and whether changes in age are comparable. Tables 6.3 gives the data for each unambiguous construction tested. Only one construction shows an overall difference between

monglots and bilinguals, and another reaches the 10% level. L'EGHO E, where the correct choice of subject for the dependent clause verb would be the first noun phrase, shows a significant association between being monoglot and correct. The inferiority of the bilinguals on this construction cannot be exploited by the theorist who would predict a general preference for the second noun phrase, since there are other constructions where the bilinguals might be expected to be inferior on such a view. The other construction, ROT'O A', requires the first noun phrase to be chosen. Moreover, the most difficult construction of all is one where the second noun phrase is correct. The fact that non-standard meanings were given to the main verbs is dealt with below. This is the real basis for the differences.

One individual Chi square value for ROT'O A' is significant. In the case of ROT'O A', the reason for an association between being bilingual and making mistakes in the middle age group is because there is a slower move amongst the bilinguals to the majority being correct.

(f) Comparison of the hierarchy of difficulty for the two groups :

Table 6.4 shows two matrices of Phi coefficients indicating the strength of association between being correct on all pairings of items. The numbers of successful children are also given. To establish if there is a hierarchy of difficulty, contingency tables were constructed to show the association between performance on every item with performance on every other item. Airasian et al.(1975) recommend giving just the matrix of exceptions to the prerequisite relation, when tables are constructed for this purpose. This is because they contain all the crucial information (the frequencies in the off-diagonal cells of the contingency tables). The matrix of exceptions to the prerequisite relationship is given for both groups in Table 6.5. As Guttman (1950) and Airasian et al. (1975) explain, the prerequisite relation often occurs despite what happens to the significance of the Phi coefficient. The difficulty hierarchies that can be inferred from Table 6.5 are diagrammed in Figure 6.3. The difficulty hierarchies implicate ROT'O A' and L'EGHO E in the way the two groups differ. The difficulty hierarchies, and the analysis of contingency tables for the association between age and success, all agree with the visual impression to be gathered from Figure 6.1, the triangular graph. There, L'EGHO E and ROT'O A' are out of place from the point of view of comparison with the triangular graph for the monoglots.

TABLE 6.3

Comparison of bilinguals and monoglots of different ages on unambiguous constructions :

Age in years	Group	Construction & Category of Response		Chi square	d.f.	P
		ROT'O A				
		Correct	Incorrect			
6+, 7+	Mono	9	11			
	Bi	1	8	1.98	1	N.S.
8+,9+,10+	Mono	26	4			
	Bi	13	11	5.55	1	$<.02$
11+,12+	Mono	17	3			
	Bi	7	2	0.00	1	N.S.
				7.53	3	$.05<P<.10$
		ROT'O D				
		Correct	Incorrect			
6+,7+	Mono	12	8			
	Bi	6	3	0.00	1	N.S.
8+,9+,10+	Mono	15	15			
	Bi	15	9	0.41	1	N.S.
11+,12+	Mono	14	6			
	Bi	7	2	0.00	1	N.S.
				0.41	3	N.S.
		L'EGHO A				
		Correct	Incorrect			
6+,7+	Mono	2	18			
	Bi	0	9	0.04	1	N.S.
8+,9+,10+	Mono	8	22			
	Bi	2	22	1.97	1	N.S.
11+,12+	Mono	10	10			
	Bi	1	8	2.71	1	N.S.
				4.72	3	N.S.
		L'EGHO E				
		Correct	Incorrect			
6+,7+	Mono	6	14			
	Bi	1	8	0.42	1	N.S.
8+,9+,10+	Mono	19	11			
	Bi	4	20	10.57	1	$<.01$
11+,12+	Mono	19	1			
	Bi	3	6	9.37	1	$<.01$
				19.36	3	$<.001$
		L'EGHO H				
		Correct	Incorrect			
6+,7+	Mono	15	5			
	Bi	6	3	0.02	1	N.S.
8+,9+,10+	Mono	24	6			
	Bi	22	2	0.66	1	N.S.
11+,12+	Mono	20	0			
	Bi	8	1	0.17	1	N.S.
				0.85	3	N.S.

TABLE 6.4

(g) Phi coefficients for associations between responses on the unambiguous items for bilinguals

	RA'	RD	LA'	LE	LH	
ROT'O A'	1.0	.05	.19	.3[illegible]	0.0	
ROT'O D		1.0	.01	.16	.07	
L'EGHO A'			1.0	.39	.01	
L'EGHO E				1.0	.22	
L'EGHO H					1.0	
Numbers of correct children :	21	28	3	8	36	Cochran's Q = 72.19
Proportions :	.50	.67	.07	.19	.86	p<.001

Note: Coefficients greater than .31 are significant.

(h) Phi coefficients for associations between responses on unambiguous items for monoglots:

	RA'	RD	LA'	LE	LH	
ROT'O A'	1.0	.22	.08	.36	.16	
ROT'O D		1.0	.05	.17	.11	
L'EGHO A'			1.0	.29	.19	
L'EGHO E				1.0	.00	
L'EGHO H					1.0	
Numbers of correct children :	52	41	20	44	59	Cochran's Q = 53.75
Proportions :	.74	.59	.28	.62	.84	p<.001

Note: Coefficients greater than .22 are significant because of the number of subjects, but Fleiss (1973) recommends ignoring those less than .30

TABLE 6.5

(i) Matrix of exceptions to the prerequisite relation for unambiguous constructions with monoglots:

	RA'	RD	LA'	LE	LH
ROT'O A'	-	14	4	6	17
ROT'O D	25	-	7	21	23
L'EGHO A'	36	28	-	27	40
L'EGHO E	14	18	3	-	22
L'EGHO H	10	5	1	7	-

(j) Matrix of exceptions to the prerequisite relation for unambiguous constructions with bilinguals:

	RA'	RD	LA'	LE	LH
ROT'O A'	-	13	0	1	18
ROT'O D	6	-	0	1	11
L'EGHO A'	18	25	-	5	33
L'EGHO E	14	21	0	-	31
L'EGHO H	3	3	0	3	-

Figure 6.3

(k) Difficulty hierarchies for five constructions :

Key

LA' = L'EGHO A' (advising)

LE = L'EGHO E (reporting)

RA' = ROT'O A' (consulting)

RD = ROT'O D (requesting a report)

LH = L'EGHO H (requesting an action)

In the monoglot results, it can be inferred from the matrix of prerequisite relations, and from the matrix of Phi coefficients that ROT'O A' (consulting) and L'EGHO H are not associated, and neither are L'EGHO E and L'EGHO A'. Success on L'EGHO H is a prerequisite for success on the other two L'EGHO constructions and ROT'O D.

In the bilingual results, success on L'EGHO H is a prerequisite for success on all the other constructions. Only ROT'O constructions have no association, and no other relationship, but both have to be comprehended in an adult-like fashion in order to succeed on L'EGHO E (reporting) and L'EGHO A' (consulting). As in the other ways of looking at the results, L'EGHO E and ROT'O A' are the constructions where bilinguals and monoglots differ.

(I) Non-standard meanings applied to the main verbs :

It is tempting to see an interference from English in the way that L'EGHO E and ROT'O A' behave in the results. However, the real reason for children making mistakes on these constructions came out of the interviews where they were asked to explain their picture choices. In the case of ROT'O A' (consulting) the children who failed monoglots and bilinguals, thought the main verb introduced a simple question - a request for information rather than a request for advice. With ROT'O D misapprehensions occurred when both monoglots and bilinguals applied "testing knowledge" meaning instead of "asking for information". The children who failed in both the monoglot and bilingual case applied non-standard meanings to some of the main verbs in constructions they found difficult. In the case of L'EGHO A' and L'EGHO E, the children who made mistakes did so because they thought that the main verb could like ask introduce an indirect question. This is not the meaning that adults allow.

In the case of L'EGHO H, the few subjects who failed did so with inconsistency, but they believed that the main verb could introduce an indirect statement. This is a use of L'EGHO which can occur, when translated as "say" but not when followed by na with the subjunctive. The real basis, then, for differences between bilinguals and monoglots is the greater prevalence of misconceptions about the meanings of the main verbs among the bilinguals, or about the effect on the meaning of the main verb of constructions in which verbs stand. This is more to do with lexicon than syntax. Table 6.6 breaks down "failures" according to the reason for not meeting the criterion.

TABLE 6.6

(m) Analysis of failures to meet criterion :

Construction	Non-standard meanings		Failure with non-standard meaning			Failure for other reasons	Total failing
			NP1	NP2	Mixed meanings		
L'EGHO A'	*question	Mono	26	2	22	0	50
		Bi	13	8	18	0	39
L'EGHO E	*question	Mono	0	10	16	0	26
		Bi	0	21	13	0	34
ROT'O D	-	Mono	0	0	0	29	29
		Bi	0	0	0	14	14
ROT'O A'	-	Mono	0	0	0	18	18
		Bi	0	0	0	21	21
L'EGHO H	*state-ment	Mono	6	0	5	0	11
		Bi	1	0	5	0	6

Note: Non-standard meanings are asterisked.

(n) Subgroups of children with common strategies :

An approach to data analysis popular in previous research has been to consider shared answer patterns. This is not a wise approach in this study since with only five KOT'O and L'EGHO constructions, there were very many answer patterns. In the bilingual group there were eleven answer patterns shown by the forty-two subjects. There were a further eleven across the same constructions shown by the monoglots, but only two bilinguals in the youngest age group (6-year-olds) had answer patterns that could not be paralleled in the monoglot results. One of these bilinguals was wrong on all five constructions. His answers to biographical questions indicated infrequent usage of Greek. The other different bilingual was wrong on all of the constructions except L'EGHO E, despite frequent usage of Greek.

Twenty six of the monoglots had answer patterns that did not occur among the bilinguals, as might be expected in a bigger group with such data. A difference that was of interest concerned children who chose the same NP for all five unambiguous constructions. The behaviour of these children can be characterized as "inflexible". They were the only counterparts of the "primitive" children in English studies, although if the ZIT'O construction is taken into account, the number of "inflexible" children decreases. "Flexible" children could change from a NP1 to a NP2 response even though they made mistakes. Children correct on all five constructions can be characterized as "sophisticated". There is a difference between monoglots and bilinguals in that only one kind of "inflexible" children was observed in the bilinguals, the results being as follows :

	Monoglots	Bilinguals
Inflexible	4 solely NP1 & 2 solely NP2	8 solely NP2
Flexible	55 can change	31 can change
Sophisticated	9 like adults	3 like adults

The absence of bilinguals from the "solely NP1" category is the only result that might be predicted from English studies, but only two of these eight seemed to have infrequent usage of Greek according to their replies to biographical question.

(o) Results from secondary measures

During the test a sample of the child's English and Greek was obtained by having a story read out loud. These speech samples were copied on to separate tapes so that the samples of English could be played to a set of English judges, and the Greek samples to Greek and Greek-Cypriot judges. Twenty of the children were judged as being native sounding both by the English and Greek judges. These were regarded as "phonologically balanced", because they do not sound foreign to either nationality. Ten of the children were judged as foreign sounding by the Greek judges, though not by theEnglish ones. These ten were regarded as "English dominant" as far as phonology was concerned. Seven children were judged as foreign sounding by the English judges, but not by the Greek judges. These were regarded as "Greek dominant" in phonology. There were five children who sounded foreign to both sets of judges. These were regarded as having a "merged" phonological system. Just one "foreign" or "dubious" judgement from a judge determined classification as "merged" or "dominant."

These judgements of phonological balance provided an independent assessment of the children, whereas the teachers' recommendation of children as "fluent", which was required for participation, was suspect. A comprehension test was used as a screening test as well, so not only were the children assuredly bilingual, but alternative measures to the main test were available.

What was done with the answers to biographical questions in the protocols was similar to the treatment of such answers in a pilot experiment. Categories of response are given in Table 6.7, together with their frequencies. A rating of the extent of Greek usage was given to every bilingual child, and also a rating of

phonological balance ("O" for "merged", "1" for "dominant" and "2" for "balanced"). Then it was possible to calculate correlation coefficients for a number of variables to see what might predict performance in the main test. Table 6.8 shows these correlation coefficients and means for the variables. Age seems the most important secondary variable.

TABLE 6.7

(p) Response categories to biographical questions :

Interaction with Parents	Interactions with Peers	Rating	Frequency
Parents and children use only Greek	Mostly Greek	7	0
Parents and children use only Greek	Language switching	6	4
Parents use all Greek but children switch	Language switching	5	3
Parents use all Greek but children switch	English is used with friends and siblings	4	3
Parents and children switch languages	Mainly English	3	16
Parents and children switch languages	Only English	2	10
Parents switch and children use only English	English or sometimes switching	1	6
Only English now	Only English	0	0
	Observed average rating :	2.98	N = 42
	Standard deviation :	1.44	

TABLE 6.8

(r) Product moment correlations for relations between primary and secondary measures :

		1.	2.	3.	4.	5.
1.	Age	1.0				
2.	Phonological balance	.00	1.0			
3.	Greek usage rating	.00	.00	1.0		
4.	Screening test	.40[a]	.00	-.01	1.0	
5.	Main test (number of correct constructions)	.45[a]	.00	.00	.54[b]	1.0
	Averages:	9.14	1.38	2.98	8.79	2.29
	Standard deviations :	2.02	0.70	1.44	1.32	1.15

[a]Significantly large (5% level)
[b]Significantly large (1% level)

(s) An alternative way of treating the results :

An alternative way of treating these results is to categorize the children. This is more natural with the phonological balance categories. Greek usage can be categorized as "relatively high" (a rating of four or more), which would mean more extensive usage than the modal category (with a rating of three). Scores on the screening test can be categorized as "less than 7", "other" or "high" (nine or more). On the main test, it is of interest to treat an "inflexible" NP2 strategy as a separate category, as well as a "high" score (more than 3 correct). Checking on the results of Table 6.8 in this way underlines the unimportance of the usage categories and phonological balance. Six contingency tables give the same information as Table 6.8, apart from the information about age.

Usage X Balance

		Balanced	Greek dominant	English dominant	Merged
Usage	High	4	3	2	1
	Not high	16	4	8	4

Chi square = 1.68 (N.S.)

Usage X Screening test

		High on screening test	Other	Low (/ 7)
Usage	High	8	3	0
	Not high	18	10	3

Chi square = 1.41 (N.S.)

Usage X Main test

		High	Other	NP2 strategy
Usage	High	2	8	0
	Not high	4	21	9

Chi square = 3.42 (N.S.)

Screening X Balance

		Balanced	Greek dominant	English dominant	Merged
Screening test	High	12	4	7	3
	Others	6	0	3	1
	Low	2	3	0	1

Chi square = 8.13, d.f. = 6 (N.S.)

Main test X Balance

		Balanced	Greek dominant	English dominant	Merged
Main test	High	2	2	1	0
	Others	13	3	8	5
	NP2 strategy	5	2	1	0

Chi square = 6.01, d.f. = 6 (N.S.)

Main test X Screening

		High	Others	/ 7
Main test	High	5	0	0
	Others	18	10	1
	NP2 strategy	3	4	1

Chi square = 5.64, d.f. = 4 (N.S.)

It does seem that children with high Greek usage are unlikely to be low on the screening test, and unlikely to adopt a NP2 inflexible strategy. Merged children, and children who were not high on the screening test, are unlikely to do well on the main test. But beyond these rather obvious relationships, there is little to be said. Similar results were found in a pilot experiment with bilinguals when production and fluency tests were the secondary tests rather than comprehension tests.

CONCLUSION

The results disconfirm any theory about bilinguals according to which some major qualitative difference from monoglots should be expected. There was a difference between monoglots and bilinguals, but what occurred was a greater frequency of the same misapprehensions about the meanings of reporting verbs than had been obtained with monoglots. There was thus a small difference in the overall number of constructions correct. The results accord best with the notion that a bilingual has a separate rule system for each of his languages, but more detailed discussion in Natsopoulos (1976) draws attention to problems for that view as well. It was surprising that the biographical information did not predict performance, although the absence of association with phonological balance was what most theorists would predict. May be, after a certain level of mastery of a language is reached, constant use is not as essential to its maintenance as might be expected. The influence of the Saturday morning schools must be given credit in this connection. Possibly the biographical questions put to the children did not get at the relevant variables. Harrison and Thomas (1976) consider that parents' consistency in using one of two languages on separate occasions is more important than mere amount of exposure. The data present problems for most contemporary ways of conceptualizing the bilingual's linguistic knowledge. Further investigation is needed with screened samples of bilinguals, as in this case, to compare what happens in language production.

CHAPTER 7

The research described in this report does not exist in a social vacuum. Older sociology books (such as McIver and Page, 1950) would see the bilingual children as representing a "transitional stage" between membership of an immigrant subculture and complete assimilation. More recent social survey studies of immigrants in Canada (Richmond, 1969 and 1974) have a more refined typology of cultural groups. The parents of the children in the present study approximate a "type" of immigrant which Richmond labels "pluralistically integrated". To be pluralistically integrated there should be an absence of acculturation problems, while "aspects of former linguistic, cultural and religious heritage or use of the mother tongue at home" have been retained. Richmond has a typology based on a large-scale survey in Toronto, where only one tenth of the sample were regarded as "pluralistically integrated". He describes other "types" which include "Anglo-Canadian Conformists" at one extreme, and "Alienated Immigrants" who were not acculturated at all. The kind of information that Richmond sought was obtained incidentally in this study, while checking on the biographical background of the bilinguals. (Further conversations with parents occurred because of their interest in what was going on). Because of the way the subjects were recruited there was little variation in the sample, and the attitude of the parents to their children's knowledge of Greek was that described by Hughes (1961), whereby the children should have "the chance that everyone has, plus a little bit more". In this case the little bit more was knowledge of Greek, while everything that the London school system has to offer was valued highly.

If the research had aimed at placing the children's bilingualism in its widest social context, it could not have come out with much more than a "type" label like the one from Toronto survey. As it is, detailed investigation of the children's

bilingualism indicates that "types" of immigrant are an oversimplification. It would be tendentious to classify the children of this study as one kind of immigrant or another, since it hardly makes sense without reference to their parents' history. There may be complications about political status in some cases, but in day-to-day interactions the majority of these children are distinguishable from monoglot children only because of surnames. When the English judges listened to the samples of the children's English, they labelled them "Cockney" when judging them to be native sounding. How the children regard themselves ethnically would be very difficult to investigate without employing a technique that would affect the variable under investigation. It could be argued, comparing them with other cultural groups, that "immigrant" is a suspect label.

Thanks to the hospitality of the "Arbeitskreis der Sprachenzentren, Sprachlehrinstitute und Fremdspracheninstitute", a Federal German organization, both researchers attended a meeting in Berlin during November 1975. At this meeting, there were discussions with groups of researchers working with guest-workers or "Gastarbeitern". Again a Richmond "type" makes a crude fit for the cultural group involved. Richmond calls immigrants with lower status than the majority, and often from rural backgrounds, "urban villagers". These retain strong links with home. The researchers in Germany would resist such over-simplification, but the contrast between the London children and the Greek-speaking children they encounter is a major qualitative one, although due to external circumstances.

Two groups of researchers were met. One was headed by Wilfried Stölting of the University of Essen, and the other by Ulrike Harnisch from the Goethe-Institut in Berlin. Also present at the meeting was a researcher from the University of Zurich in Switzerland, a Frau Dimitriou, who was married to a Greek-Cypriot.

Although linguistic problems were involved, centering on a variety of German which has come to be called "Gastarbeiterdeutsch", this kind of research was almost entirely concerned with social conditions and welfare problems. Considerable interest was shown in the capabilities of the London children, since these researchers would rather have been concerned with the kind of bilingualism that was possible, rather than that forced by disadvantageous circumstances on underprivileged groups.

A meeting in Salzburg in August, 1976, the last month of the grant enabled contact to be established with researchers into secondary language acquisition at the University of Kiel. These researchers make distinctions between bilingualism as the child's first language, and instances where one language is established (say German) before the second begins to be acquired. The findings they quote are with very young children. The data from the London bilinguals, where no differences were associated with a consistent use of Greek by the parents, count against the importance of these distinctions in older children.

The contacts with researchers in Germany have proved very fruitful, and the senior investigator has been invited to a meeting since the termination of the period of the grant. However attitudes in England are often different. Even academics in psychology departments have asked the senior investigator, "Are they very retarded?" The belief that a second language is an extra mental load occurs in Britain, but it is less frequent in other European countries, where everyday use of more than one language is a common-place. It will be the senior investigator's task to disseminate the results in Britain.

Some indication that attitudes to the bilingual child without social problems are changing, inside Britain, can be found in the Bullock Report (Department of Education and Science, 1975). The Bullock report contains a Chapter (Ch. 20) entitled "Children from families of overseas origin". Two recommendations in the report concern the children studied in this project. They are Recommendations 265 and 266, which state :

> "265. Every school with pupils whose original language is not English should adopt a positive attitude to their bilingualism and wherever possible help maintain and deepen their knowledge of their mother tongue."
>
> "266. There should be further research into the teaching of their own language to children of immigrant communities and into various aspects of bilingualism in schools."

There is clearly a move away from the attitudes to bilingual children in books like that of McIver and Page (1950), where almost inevitable assimilation is the only future considered possible. McIver and Page have classificatory schemes that are simply reflections of a "melting pot" society. The metaphor of the "melting pot" is often used to describe the American policy and practice of assimilation of alien (that is, non-Anglo-Saxon) cultures. Magner (1976) traces the metaphor to Israel Zangwill who used it as the title of a play produced on Broadway in 1908. Magner dates the assimilation policy in the United States as far back as Benjamin Franklin. The situation in the United States is described by Haugen (1969, p. 2) when he says "Bilingualism has been treated as a necessary evil, a rash on the body politic, which time might be expected to cure without the need of calling in the doctors."

Apart from the question of whether a melting pot is a desirable form of society, it is worth asking whether there is any evidence for the possibility of an alternative. Is the Bullock Report recommendation of a positive attitude well founded, or is it recommending the rubbing of a fading rash which will eventually disappear anyway?

The evidence from the London Greek-speaking children strongly supports the view that discussing alternatives to the melting pot society is well worthwhile. On all the linguistic measures, there was an improvement with age in spite of an extensive use of the majority language, English. The children's knowledge of Greek was developing, even in the contemporary situation. Instead of "a language for life" the children had languages for life.

What needs to be discussed at this point is the question whether the Bullock Report recommendations go far enough. Should there be a further commitment on the scale of the multicultural programme in Canada? In the Canadian Federal Government, there is a "multiculturalism Directorate" in the Department of the Secretary of State, and a "Minister Responsible for Multiculturalism/Ministre charge de Multiculturisme". There is body called the "Canadian Consultative Council on Multiculturalism" (CCCM) which advises the minister. The composition of the CCCM reflects the distribution of ethnic and cultural groups throughout the Federation. The commitment is to promoting multiculturalism, aside from promoting French as an official language. In a conference (see Canadian Council on Multiculturalism, 1976) held on February 13 to 15th, 1976, Guy Rocher, a sociologist at the University of Montreal, complained that multiculturalism is a threat to "bilingualism" (the policy of promoting French). Canada has a situation so different from the "melting pot" that these complaints were reported in the national press on February 17th. The complaint was that "Montreal is already familiar with the sort of bilingualism that multicultural policy tends to produce . . . among new Canadians bilingualism means English and Greek, English and Italian or English and German, while English-French bilingualism is practically non-existent". If the Bullock Report represents a move away from "melting pot" views, then a further move would be in the direction of the Canadian Royal Commission on Bilingualism and Multiculturalism (see Department of the Secretary of State, 1969). The introduction to the fourth volume of this commission's report begins with a frankly appreciative account of the

value to society of people who have a distinctive language and culture. The introduction states : "The presence in Canada of many people whose language (is) distinctive . . . presents an inestimable enrichment that Canadia. cannot afford to lose . . . Linguistic variety is unquestionably an advantage . . . Their presence facilitates communication between Canada and the rest of the world . . . we consider them an integral part of the national wealth".

The recommendations in the Canadian report go much further than those in the Bullock report, although it must be said that the terms of reference differed considerably. There is a recommendation "that the appropriate federal, provincial and muncipal agencies receive the financial means they require to maintain and extend their support to cultural and research organisations whose objectives are to foster the arts and letters of cultural groups other than the British or French." Besides recommending a place in the school curriculum for studies where other cultural groups could have positive encouragement, the report recommends extending existing aid to ethnic publications, the use of languages other than the official languages in broadcasting and the use of minority languages for productions of the National Film Board.

At present there is a debate between pluralists and assimilationists in Canada, the one group believing it to be desirable for society to foster "unmelted" groups, and the others believing that assimilation is desirable. The results from testing the London children favour opening such a debate in Britain.

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APPENDIX A

Linguistic constructions tested in the first experiment:

Ambiguous nominal expressions (three sentences):

1. To kjinjitó ton k'urase pol'i ton K'osta
(art.) (chasing) (art.) (tired) (much) (art.) (K'osta)
1a) K'ostas chasing (someone) got very tired
1b) K'ostas being chased (by someone) got very tired
2. To dhóro tu K'osta 'itan pol'i or'eo
(art.)(gift) (art.)(K'osta) was (very) (nice)
2a) The gift K'ostas gave someone was very nice
2b) The gift K'ostas was given (by someone) was very nice
3. O jatr'os 'ixe pol'es episk'epsis s'imera
(art.)(doctor) (had) (many) (visits) (today)
3a) The doctor visited a lot of patients today
3b) The doctor was visited by a lot of patients today

Unambiguous ROT'O (ask=consulting) construction A (three sentences):

4. O J'annis r'otise ti M'eri ti fr'uta n'aghor'asi
(art.) (John) (asked) (art.)(Mary)(what)(fruit) (part) (buy)
4a) John asked Mary what fruit to buy
5. O J'annis r'otise ti M'eri pj'a ombr'ela na p'ari
(art.) (John) (asked) (art.)(Mary)(which)(umbrella)(part.)(take)
5a) John asked Mary which umbrella to take
6. O J'annis r'otise ti M'eri pj'o pált'o na for'esi
(art.) (John) (asked) (art.)(Mary)(which)(overcoat)(part.)(put on)
6a) John asked Mary which overcoat to put on

Ambiguous ROT'O (ask=question) construction B (three sentences):

7. O J'annis r'otise ti M'eri ti dh'ora agh'orase
(art.) (John) (asked) (art.)(Mary)(what)(gifts) (bought)
7a) John asked Mary what gifts she bought
7b) John asked Mary what gifts he bought
8. O J'annis r'otise ti M'eri pu taks'idhepse
(art.) (John) (asked) (art.)(Mary)(where) (travelled)
8a) John asked Mary where she travelled
8b) John asked Mary where he travelled
9. O J'annis r'otise ti M'eri p'oso agh'orase to kjen'urjo podh'ilato
(art.) (John) (asked) (art.)(Mary)(how much)(bought) (art.) (new) (bicycle)
9a) John asked Mary for how much she bought the new bicycle
9b) John asked Mary for how much he bought the new bicycle

Unambiguous ROT'O (ask=question) construction C (three sentences):

10. O J'annis r'otise ti M'eri pj'o vivl'jo tha p'ari
(art.) (John) (asked) (art.)(Mary)(which) (book) (part.)(take)
10a) John asked Mary which book she would take
10b) John asked Mary which book he (would or should) take
11. O J'annis r'otise ti M'eri pj'o leofor'io tha p'ari
(art.) (John) (asked) (art.)(Mary)(which) (bus) (part.)(catch)
11a) John asked Mary which bus she would catch
11) John asked Mary which bus he (would or should) catch
12. O J'annis r'otise ti M'eri pj'o kap'elo tha for'esi
(art.) (John) (asked) (art.)(Mary)(which) (hat) (part.) (wear)
12a) John asked Mary which hat she would wear
12b) John asked Mary which hat he (would or should) wear

Unambiguous L'EGHO (advising) construction A (three sentences):

13. O J'orghos 'ipe stin El'eni ti jalj'a n'aghor'asi
(art) (George) (told) (prep)(Helen) (what)(sunglasses) (part) (buy)
13a))George told Helen what sunglasses to buy
14. O J'orghos 'ipe stin El'eni pj'a pa p'utsia na v'ali
(art) (George) (told) (prep)(Helen) (what) (shoes) (part) (wear)
14a) George told Helen what shoes to wear
15. O J'orghos 'ipe stin El'eni ti xjim'us (pot'a)na p'ini
(art) (George) (told) (prep) (Helen)(what) (juice) (part) (drink)
15a) George told Helen what juice to drink

Ambiguous L'EGHO (tell) construction B (three sentences):

16. O J'orghos 'ipe stin El'eni ti pexn'idhja agh'orase
(art) (George) (told) (prep) (Helen)(what) (toys) (bought)
16a) George told Helen what toys he bought
16b) George told Helen what toys she bought
17. O J'orghos 'ipe stin El'eni pj'a b'ala p'ire
(art) (George) (told) (prep) (Helen)(which) (ball) (took)
17a) George told Helen which ball he took
17b) George told Helen which ball she took
18. O J'orghos 'ipe stin El'eni ti bal'onja dhi'alekse
(art) (George) (told) (prep) (Helen)(what)(balloons) (chose)
18a) George told Helen what balloons he chose
18b) George told Helen what balloons she chose

Ambiguous L'EGHO (tell) construction C (three sentences):

19. O J'orghos 'ipe stin El'eni pj'on aet'o tha pet'aksi
(art) (George) (told)(prep) (Helen) (which) (kite)(part) (fly)
19a) George told Helen which kite he would fly
19b) George told Helen which kite she should fly
20. O J'orghos 'ipe stin El'eni pj'o podh'ilato tha p'ari
(art) (George) (told) (prep) (Helen)(which) (bicycle) (part) (take)
20a) George told Helen which bicycle he would take
20b) George told Helen which bicycle she should take
21. O J'orghos 'ipe stin El'eni pj'o aftoxj'inito tha odhij'isi
(art) (George) (told) (prep) (Helen)(which) (toy-car) (part) (drive)
21a) George told Helen which toy-car he would drive
21b) George told Helen which toy-car she should drive

Ambiguous L'EGHO (tell) construction D (three sentences):

22. O J'orghos 'ipe stin El'eni na p'eksi me ta kjen'urja pexn'idhja
(art) (George) (told) (prep) (Helen)(part) (play)(prep)(art) (new) (toys)
22a) George told Helen to play with the new toys
22b) George said to Helen could he play with the new toys
23. O J'orghos 'ipe stin El'eni n'aghor'asi poll'a vivl'ja
(art) (George) (told) (prep) (Helen)(part) (buy) (many) (books)
23a) George told Helen to buy a lot of books
23b) George said to Helen could he buy a lot of books
24. O J'orghos 'ipe stin El'eni na perim'eni ti mam'a sto stathm'o
(art) (George) (told) (prep) (Helen)(part) (wait) (art)(mother)(prep)(station)
24a) George told Helen to wait for mother at station
24b) George said to Helen should he wait for mother at station

Ambiguous ZIT'O (request) construction (three sentences):

25. O J'orghos z'itise ap' to J'anni na k'opsi to x'orto ston kj'ipo
(art)(George) (asked)(prep)(art)(John)(part)(cut) (art)(grass)(prep)(garden)
25a) George asked John to cut the grass in the garden
25b) George asked John if he (George) could cut the grass in the garden
26. O J'orghos z'itise ap' ti M'eri na f'iji
(art)(George) (asked)(prep)(art)(Mary)(part)(leave)
26a) George asked Mary to leave
26b) George asked Mary if he could leave
27. I M'eri z'itise ap' tin Anna na tin p'ai sinem'a
(art)(Mary)(asked)(prep)(art)(Anna)(part)(art)(take)(to the movies)
27a) Mary asked Anna to take her to the movies
27b) Mary asked Anna if she (Mary) could take her to the movies
27c) Mary asked Anna to take her (Helen) to the movies
27d) Mary asked Anna if she (Mary) could take her (Helen) to the movies

Ambiguous SIMFON'O (agree) construction (three sentences):

28. O J'orghos simf'onise meto J'anni na pot'isi ton kj'ipo
(art) (George) (agreed) (prep)(art)(John)(part)(water)(art)(garden)
28a) George agreed with John that he (George) should (or would) water the garden
28b) George agreed with John that he (John) should (or could) water the garden
29. I M'eri simf'onise metin El'eni n'aghor'asi kjen'urjo kap'elo ja tin
(art)(Mary) (agreed) (prep)(art)(Helen) (part) (buy) (new) (hat)(prep)(art)
k'ukla
(doll)
29a) Mary agreed with Helen that she (Mary) should (or would) buy a new hat for the doll
29b) Mary agreed with Helen that she (Helen) could buy a new hat for the doll
30 O J'orghos simf'onise meto J'anni na tu dh'osi to aftokj'inito
(art) (George) (agreed) (prep)(art)(John)(part)(art)(give)(art) (toy-car)
30a) George agreed with John that he (George) would give him the toy-car
30b) George agreed with John that he (John) would give him the toy-car
30c) George agreed with John that he (George) would give him (Kóstas) the toy-car
30d) George agreed with John that he (John) would give him (Kostas) the toy-car

Unambiguous IP'OSXOME (promise) construction A (three sentences):

31. O K'ostas iposxjéthikje stin Anna na kuval'isi tis val'itses
(art)(K'ostas) (promised) (prep)(Anna)(part) (carry)(art)(suitcases)
31a) K'ostas promised Anna to carry the suitcases
32. O K'ostas iposxjethikje stin Anna na dhjav'azi ta math'imata
(art)(K'ostas) (promised) (prep)(Anna) (part)(study) (art) (lessons)
32a) K'ostas promised Anna to study
33. O K'ostas iposxjéthikje stin Anna na voith'isi ti mam'a
(art)(K'ostas) (promised) (prep)(Anna)(part) (help) (art)(mother)
33a) K'ostas promised Anna to help mother

Unambiguous IP'OSXOME (promise) construction B (three sentences):

34. O K'ostas iposxjéthikje stin Anna na dhjal'eksi 'opjo bal'oni 'ithel
(art)(K'ostas) (promised) (prep)(Anna) (part) (choose)(whichever)(balloon)(liked)
34a) K'ostas promised Anna she could choose the balloon she wanted to
35. O K'ostas iposxjéthikje stin Anna na pi'i'oti xjim'o 'ithele
(art)(K'ostas) (promised) (prep)(Anna) (part)(drink)(whichever)(juice)(liked)
35a) K'ostas promised Anna she could drink the juice she liked
36. O K'ostas iposxjéthikje stin Anna na p'ari 'opjo podh'ilato 'ithele
(art)(K'ostas) (promised) (prep)(Anna) (part)(take)(whichever)(bicycle) (liked)
36a) K'ostas promised Anna she could take the bicycle she liked

Ambiguous IP'OSXOME (promise) construction C (three sentences):

37. O K'ostas iposxjéthikje stin Anna na k'opsi poll'a lul'uδhja ap'ton kj'ipo
(artIK'ostas) (promised) (prepIAnnaIpart) (cut) (many) (flowersIprepIartIgarden
37a) K'ostas promised Anna to cut a lot of flowers from the garden
37b) K'ostas promised Anna she could cut a lot of flowers from the garden
38. O K'ostas iposxjéthikje stin Anna nata'izi sixn'a to 'omorfo mikr'o
(artIK'ostas) (promised) (prepIAnnaIpartIfeed) (oftenIartIbeautifulIsmall)
skjil'aki
(dog)
38a) K'ostas promised Anna to feed frequently the small beautiful dog
38b) K'ostas promised Anna she could frequently feed the small beautiful dog
39. O K'ostas iposxjéthikje stin Anna na odhij'isi to aftokj'inito
(artIK'ostas) (promised) (prepIAnnaIpart) (drive) (art) (toy-car)
39a) K'ostas promised Anna to drive the toy-car
39b) K'ostas promised Anna she could drive the toy-car

Linguistic constructions tested in the second experiment:

Unambiguous ROT'O (consulting) construction A' (the same as ROT'O A in the first experiment under the numbers : 4,5,6.)

Unambiguous ROT'O (ask=question) construction D (three sentences):

40. O J'annis r'otise ti M'eri p'oses aspir'ines p'ire ('ipje)ja ti ghr'ipi
(art)(John) (asked)(art)(Mary)(how many)(aspirins) (took) (prep)(art) (flu)
40a) John asked Mary how many aspirins she took for flu
41. O J'annis r'otise ti M'eri posta p'erase stin ekdhrom'i me to sxol'jo
(art)(John) (asked)(art)(Mary) (how)(enjoyed)(prep)(outing) (prep)(art)(school)
41a) John asked Mary how she enjoyed the outing
42. O J'annis r'otise ti M'eri p'oses val'itses 'ixe ja 'ena t'oso mikr'o
(art)(John) (asked)(art)(Mary)(how many)(suitcases)(had)(prep)(a) (so) (small)
taks'idhi
(journey)
42a) John asked Mary how many suitcases she carried for such a small journey

Unambiguous ROT'O (ask=question) construction E (three sentences):

43. O J'annis r'otise ti M'eri se pj'o sinem'a 'itan kal'itera na p'ai ap'opse
(art) (John) (asked) (art)(Mary)(prep)(which) (movies) (was) (better) (part) (go) (tonight)
43a) John asked Mary which film was better to go to tonight
44. O J'annis r'otise ti M'eri p'osin 'ora m'ono 'eprepe na p'eksi metin kjen'urj
(art) (John) (asked) (art)(Mary) (how) (long) (only)(should)(part)(play)(prep)(art) (new)
bala ston kj'ipo
(ball)(prep)(garden)
44a) John asked Mary how long he should play with the new ball in the garden
45. O J'annis r'otise ti M'eri me pj'a ap'ta kjen'urja pexn'idhja tha bor'use na
(art) (John) (asked) (art)(Mary) (prep) (which)(prep)(art)(new) (toys) (part)(could)(part)
p'eksi m'ono jal'iji 'ora
(play) (only)(prep)(short)(tim
45a) John asked Mary which of the new toys he could play with for only a short time

Unambiguous ROT'O (ask=question) construction F (three sentences):

46. O J'annis r'otise ti M'eri p'ote tha telj'osi to dhj'avasma kje to ghr'apsimo
(art) (John) (asked) (art)(Mary)(when) (part)(finish) (art)(studying) (and)(art)(writing)
46a) John asked Mary when she would finish studying and writing
47. O J'annis r'otise ti M'eri tixjimo ap'olous tha protim'isi
(art) (John) (asked) (art)(Mary)(which) (juice)(prep)(all)(part) (prefer)
47a) John asked Mary which juice she would prefer
48. O J'annis r'otise ti M'eri pu tha taksidh'epsi proi-proi t'oso vjastik'a
(art) (John) (asked) (art)(Mary)(where)(part) (travel) (early morning) ('n a hurry)
48a) John asked Mary where she would travel in the early morning in such a hurry

Unambiguous ROT'O (ask=question) construction G (three sentences):

49. O J'annis r'otise ti M'eri pos kje ti tha for'esi ja na 'exji kje p'ali
(art) (John) (asked)(art)(Mary)(how) (and)(what)(part) (wear)(prep)(part)(have)(and)(again)
ap'opse topjó 'omorfa d'isimo sti jort'i tu bab'a
(tonight)(art) (best) (dress) (prep)(day name)(prep)
(father)
49a) John asked Mary what and how he should get dressed to be very smart again on
father's nameday
50. O J'annis r'otise ti M'eri pos tha zoghraf'isi kal'itera jana p'ariton
(art) (John) (asked)(art)(Mary)(how)(part) (paint) (better)(prep)(part) (get)(art)
pr'oto vathm'o sto sxol'jo
(first) (marks)(prep) (school)
50a) John asked Mary how to paint better to get the first marks in school
51. O J'annis r'otise ti M'eri se pj'on arithm'o tha tilefon'isi ton pap'u
(art) (John) (asked)(art)(Mary)(prep)(which)(number) (part) (ring) (art)(grandfather)
ja na min k'ani kjep'ali l'athos

Ambiguous ROT'O (ask-question) construction C' (three sentences preceded by context):

Preceding context. Mary had two beautiful coloured kites. John wanted to fly one of them. Mary told him that she was thinking to give him one, and keep the other for herself, but she could not decide which one to give John and which one to keep for herself.

52. O J'annis r'otise ti M'eri pj'on xartaet'o tha pet'akṣi
(art) (John) (asked|art|Mary|which) (kite) (part) (fly)
52a) John asked Mary which kite he should fly
52b) John asked Mary which kite she would fly

Preceding context. Grandfather bought two balloons, a green one and a red one. Grandfather told Mary to decide which balloon she should take for herself and which one John should take.

53. O J'annis r'otise ti M'eri pjo bal'oni tha p'ari
(art) (John) (asked|art|Mary|which|balloon|part|take)
53a) John asked Mary which balloon he should take
53b) John asked Mary which balloon she would take

Preceding context. Grandmother bought new story books for John and Mary because they love them. She told them not to quarrel but John should take some to read and Mary could take some as well.

54. O J'annis r'otise ti M'eri pj'a vivl'ja tha dhjav'asi
(art) (John) (asked|art|Mary) (which|books) (part) (read)
54a) John asked Mary which books he should read
54b) John asked Mary which books she would read

Ambiguous ZIT'O (request) construction A (three sentences preceded by context):

Preceding context. John and Mary love their grandfather very much. They saved money to buy beautiful flowers (or roses) on his nameday, because grandfather loves flowers, and they wanted to please him.

55. O J'annis zitise ap'ti M'eri n'aghor'asi kje k'okjina kje kjitrina
(art) (John) (asked|prep|art|Mary|part|buy) (and) (red) (and) (yellow)
triand'afilla ja ton pap'u
(roses) (prep|art|grandfather)
55a) John asked Mary if he could buy red and yellow roses for grandfather
55b) John asked Mary to buy red and yellow roses for grandfather

Preceding context. Mary has got a lovely little cat. John loves the small cat very much, and he especially wants either to feed the cat himself or to get Mary to do so, because he would like the little cat to be very happy.

56. O J'annis z'itise ap'ti M'eri na ta'isi ti gh'ata
(art) (John) (asked|prep|art|Mary|part|feed|art|cat)
56a) John asked Mary if he could feed the cat
56b) John asked Mary to feed the cat

Context preceding. John and Mary very often go on holidays. They always carry big and small suitcases full of things which they need during their holidays.

57. O J'annis z'itise ap'ti M'eri na kuval'isi m'ono tis mikr'es val'itses
(art) (John) (asked|prep|art|Mary|part) (carry) (only) (art) (small) (suitcases)
57a) John asked Mary if he could carry only the small suitcases
57b) John asked Mary to carry only the small suitcases

Ambiguous SIMFON'O (agree) construction A (three sentences preceded by context):

Preceding context. John and Mary always divided their housework, and did half each.

58. O J'annis simf'onise me ti M'eri na pot'isi ta lul'udhja
(art) (John) (agreed|prep|art|Mary|part|water) (art) (flowers)
58a) John agreed with Mary he should (or would) water the flowers
58b) John agreed with Mary she should (or could) water the flowers

Preceding context. John's and Mary's parents were on holidays. John and Mary stayed at home. They shared the housework by doing it in turn.

59. O J'annis simf'onise me ti M'eri n'aghor'asi tr'ofima kje fr'uta ja'oli
(art) (John) (agreed) (prep|art|Mary|part|buy) (food) (and) (fruit|prep|all)
tin evdhom'adha
(art) (week)
59a) John agreed with Mary he should (or would) buy food and fruit for the week
59b) John agreed with Mary she should (or could) buy food and fruit for the week

Preceding context. John and Mary used to share all their toys, and they had very many. They always bought new toys. But all day yesterday they were thinking of giving their old toys to a poor child, a friend of theirs.

60. O J'annis simf'onise me ti M'eri na dh'osi ta palj'a pexn'idhja
(art) (John) (agreed) (prep|art|Mary|part|give|art) (old) (toys)
60a) John agreed with Mary he should (or would) give the old toys
60b) John agreed with Mary she would (or should) give the old toys

Unambiguous L'EGHO (advising) construction A (the same as in the first experiment under the numbers: 13, 14, 15.

Unambiguous L'EGHO (tell) construction E (three sentences):

61. O J'orghos 'ipe stin El'eni p'oso dh'iskola vivl'ja dhj'avase
(art) (George) (told) (prep|Helen|how) (difficult) (books) (read)
f'etos sto sxol'jo xor'is megh'alo k'opo(k'urasi)
(this year|prep|school|without) (big) (effort|or tiredn
61a) George told Anna what difficult books he read last year in school without much effort

62. O J'orghos 'ipe stin El'eni p'oso pol'i kur'astikje k'ovondas t'oses'ores
(art) (George) (told) (prep|Helen) (how) (much))got tired) (cutting|so long time)
x'orto ston kj'ipo
(grass|prep) (garden)
62a) George told Anna how tired he got, cutting grass for such a long time in the garden

63. O J'orghos 'ipe stin El'eni p'oso kal'itera esthan'otan ('enjothe) s'imera
(art) (George) (told|prep) (Helen) (how) (better) (felt) (was) (today)
63a) George told Anna how much better he felt (or was) yesterday

Unambiguous L'EGHO (tell) construction F (three sentences):

64. O J'orghos 'ipe stin El'eni ti kakoftjaghm'ena jalj'a for'use sin'exja
(art) (George) (told|prep|Helen|what) (bad) (sunglasses) (wore) (always)
64a) George told Helen what bad sunglasses she was always wearing

65. O J'orghos 'ipe stin El'eni ti pol'a kje megh'ala l'athi'ekane sin'exja
(art) (George) (told|prep|Helen|what|many|and|serious|mistakes|made|always)
staghr'ammata tu pap'u
(prep|letters) (art|grandfather)
65a) George told Anna how she was always making frequent and bad mistakes in the letters to grandfather

66. O J'orghos 'ipe stin El'eni ti 'asxima ksesk'onise kje s'imera p'ali to
(art) (George) (told|prep|Helen) (how) (badly) (dusted) (and) (today) (again) (art)
trap'ezi
(table)
66a) George told Helen how badly she dusted the table again yesterday

Unambiguous L'EGHO (tell) construction G (three sentences):

67. O J'orghos 'ipe stin El'eni p'oso or'ea(efx'arista) n'ea tha ghr'apsi
(art) (George) (told|prep|Helen) (how) (nice) or (pleasant) (news|part) (write)
am'esos sto bab'a ja tin pr'oodh'o tus
(immediately|prep|father|prep|art|progress|their)
67a) George told Helen what a nice news he would immediately write to father about their progress

68. O J'orghos 'ipe stin El'eni me ti xar'a tha zograf'isi ta 'omorfa pulj'a
(art) (George) (told|prep|Helen|prep|what|joy|part|paint|art|beautiful) (birds)
tu kj'ipu
(art|garden)
68a) George told Anna how pleased he would be to paint beautiful birds in the garden

69. O J'orghos 'ipe stin El'eni me p'osi efxar'istisi tha voith'isi ti
(art) (George) (told|prep|Helen|prep|how|pleasure) (part) (help) (art)
man'a stis dh'iskoles dhoul'jes
(mother|prep|difficult|housework)
69a) George told Helen how delighted he would be to help mother with difficult housework.

Unambiguous L'EGHO (tell) construction H (three sentences):

70. O J'orghos 'ipe stin El'eni na tr'oi 'olo to fajit'o 'opos kje pr'ota
(art) (George) (told) (prep|Helen|part|eat) (all|art|food) (as) (and|before)
70a) George told Helen to eat the food as before
71. O J'orghos 'ipe stin El'eni na ksodh'evi pj'o l'igha left'a ja sokol'ates
(art) (George) (told) (prep|Helen|part|spend) (less) (money) (prep|chocolate
kje ja pexn'idhja
(and|prep) (toys)
71a) George told Helen to spend less money on chololates and toys
72. O J'orghos 'ipe stin El'eni na dhjav'azi periss'otero f'etos
(art) (George) (told|prep|Helen|part) (study) (more) (this year)
72a) George told Helen to study more this year

Unambiguous L'EGHO (tell) construction I (three sentences):

73. O J'orghos 'ipe stin El'eni na l'ipsi ja l'igho m'ono se mj'a viastik j'i
(art) (George) (told|prep|Helen) (part|leave) (prep) (short|only|one|urgent)
dhulj'a kj'oti tha jir'isi am'esos p'iso tr'exondas
(job) (and) (that) (part) (come|immediately|back)
(running
73a) George said Helen could he go out for something urgent only for a few minu
and he would come back immediately at the double
74. O J'orghos 'ipe stin El'eni na p'eksi ja l'igho m'ono me ti b'ala, kj'oti
(art) (George) (told|prep|Helen|part|play|prep|short|only|prep|art|ball) (and)
tha ti dh'osi am'esos p'iso
(that|part|art|give|immediately|back)
74a) George said to Helen could he play with the ball only for a short while,
and he would give it back immediately
75. O J'orghos 'ipe stin El'eni na p'ari m'ono to pr'asino bal'oni ki'oti
(art) (George) (told|prep|Helen|part|take|only) (art|green) (balbon) (and)
dhe tha zit'isi pote'alo pexn'idhi
(that|not|part) (ask|never) (other|toy)
75a) George said to Helen could he take only the green balloon, and he would
never ask for another toy

Ambiguous L'EGHO (tell) construction C' (three sentences preceded by context):

Preceding context. George and Helen have two overcoats each. Tonight they are going to the theatre and they are wondering which overcoat to put on to be very smart.

76. O J'orghos 'ipe stin El'eni pj'o palt'o tha for'esi
(art) (George) (told|prep|Helen) (which|overcoat|part|put on)
76a) George told Helen which coat he would put on
76b) George told Helen which coat she should put on

Preceding context. In summer it was very hot and the small trees in the garden were thirsty. Grandfather said to George and Helen that they needed watering. He told George and Mary to decide to water half of them each.

77. O J'orghos 'ipe stin El'eni pj'a dhendr'akja tha pot'isi
(art) (George) (told|prep|Helen) (which|small trees|part|water)
77a) George told Helen which small trees he would water
77b) George told Helen which small trees she should water

Preceding context. George and Helen saved money to buy a very good bicycle each. Yesterday they went to the town and saw some very good bicycles. They were thinking of which, out of all the bicycles, they should choose.

78. O J'orghos 'ipe stin El'eni pj'o podh'ilato tha dhjal'eksi
(art) (George) (told|prep) (Helen|which|bicycle) (part.) (choose)
78a) George told Helen which bicycle he would choose
78b) George told Helen which bicycle she should choose.

Linguistic constructions tested in the third experiment with bilinguals:

Unambiguous ROT'O (consulting) construction A' (three sentences, the same as A in the first and second experiment under the numbers: 4, 5, 6).

Unambiguous ROT'O (ask=question) construction D (three sentences, the same as in the second experiment under the numbers 40, 41, 42):

Ambiguous ZIT'O (request) construction A (three sentences, preceded by context, the same as in the second experiment under the numbers: 55, 56, 57).

Unambiguous L'EGHO (tell) construction A (three sentences, the same as A in the first and second experiment under the numbers: 13, 14, 15).

Unambiguous L'EGHO (tell) construction E (three sentences, the same as in the second experiment under the numbers: 61, 62, 63).

Unambiguous L'EGHO (tell) construction H (three sentences, the same as in the second experiment under the numbers: 70, 71, 72).

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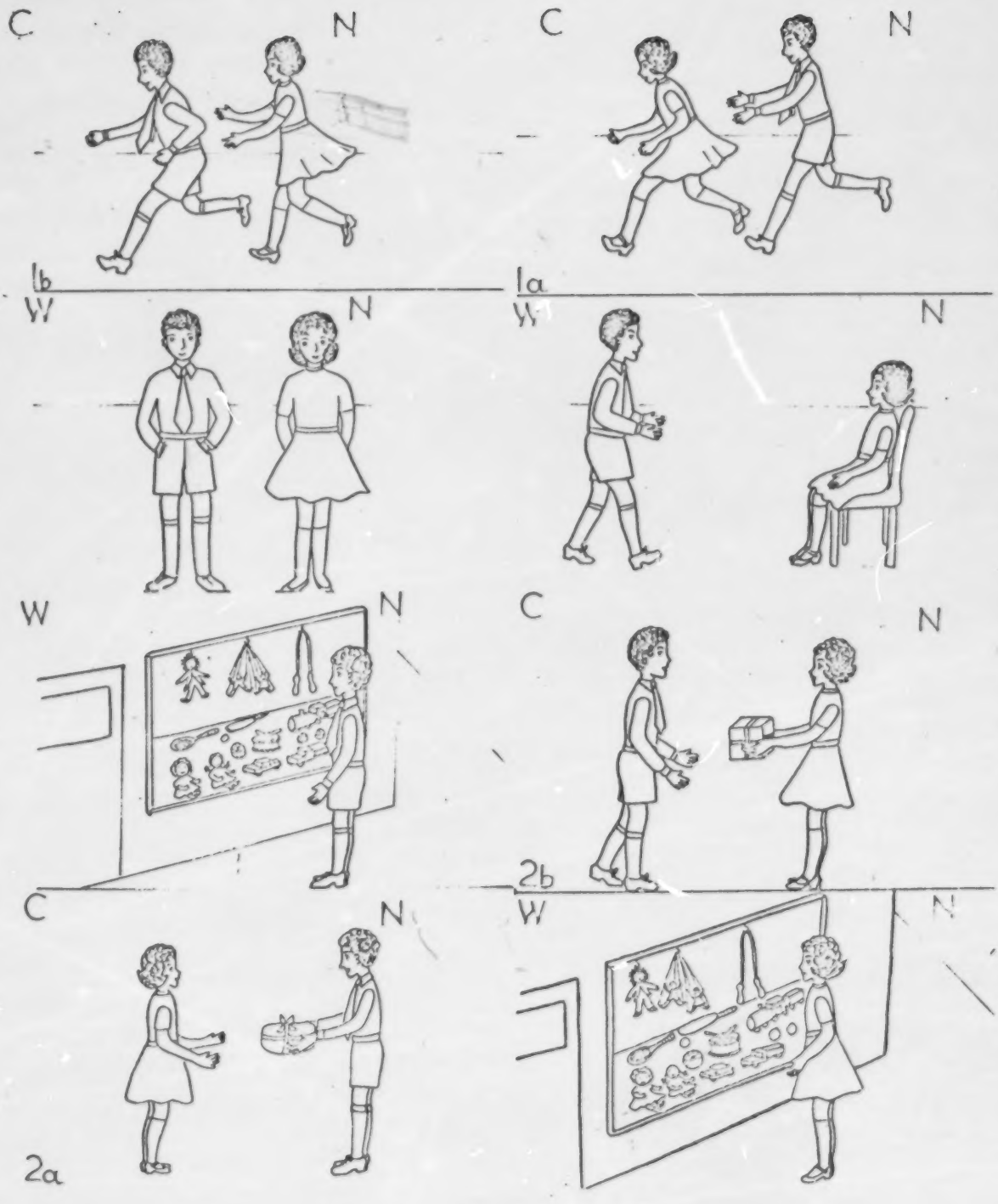

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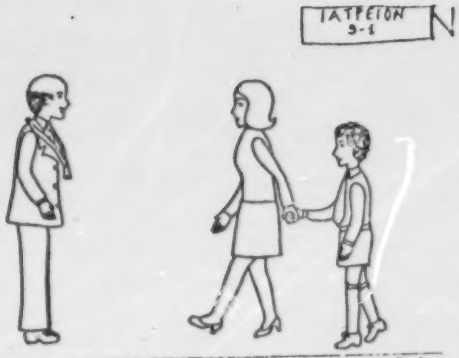

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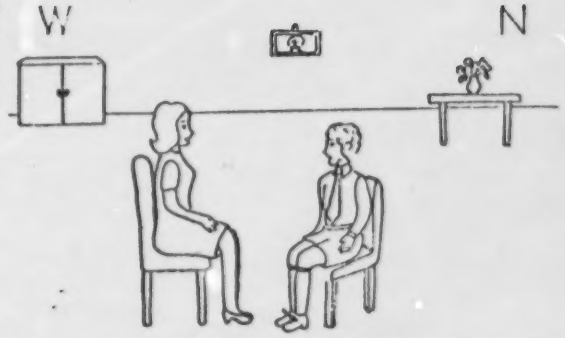
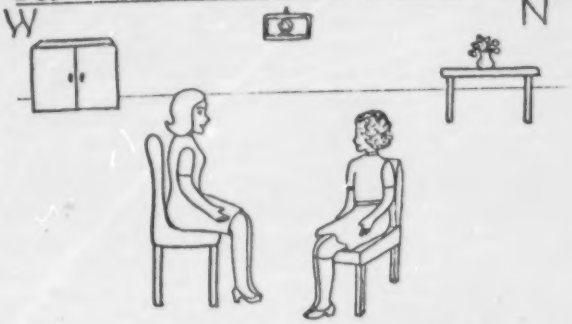


3a

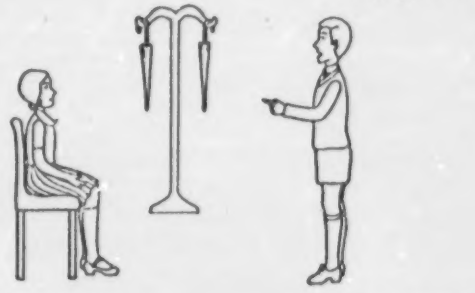
W N



C N

3b

C "R"A or A'



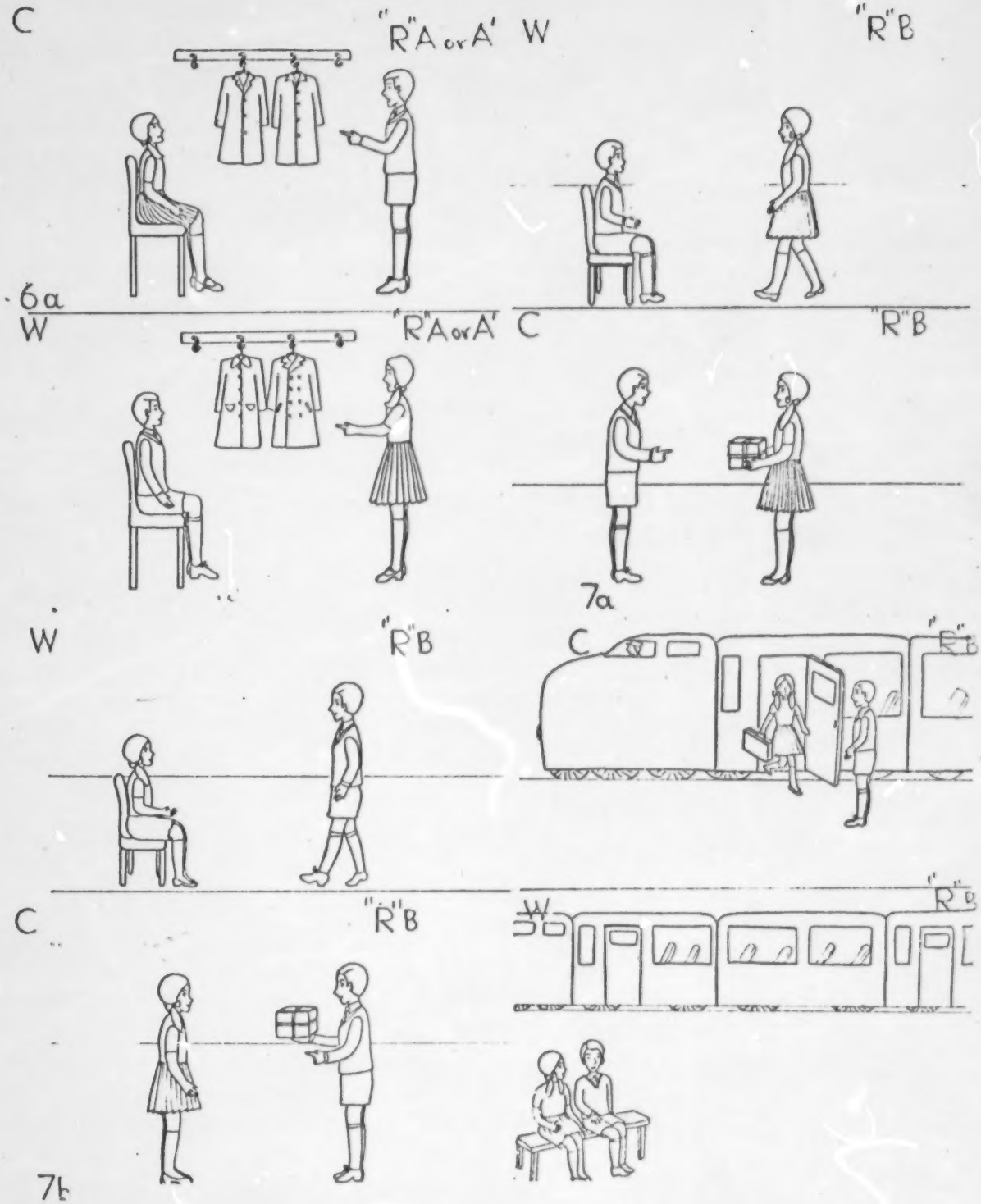
C "R"A or A'

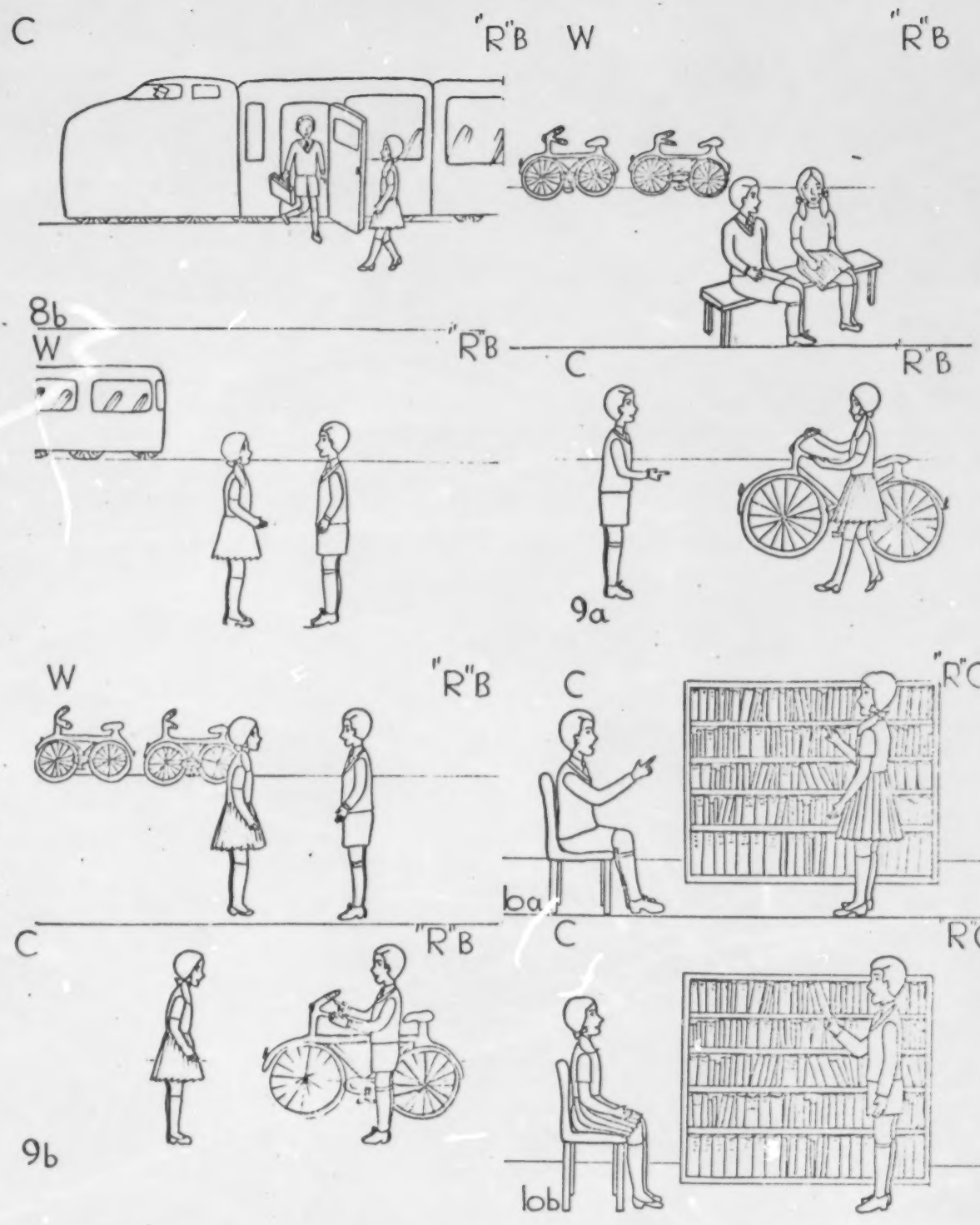
4a

5a

W "R'A or A'

W "R'A or A'


C
"R"A or A'
W
"R"B
6a
W
"R"A or A'
C
"R"B
7a
W
"R"B
C
"R"B
C
"R"B
W
"R"B
7b


C
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W
"R"B
8b
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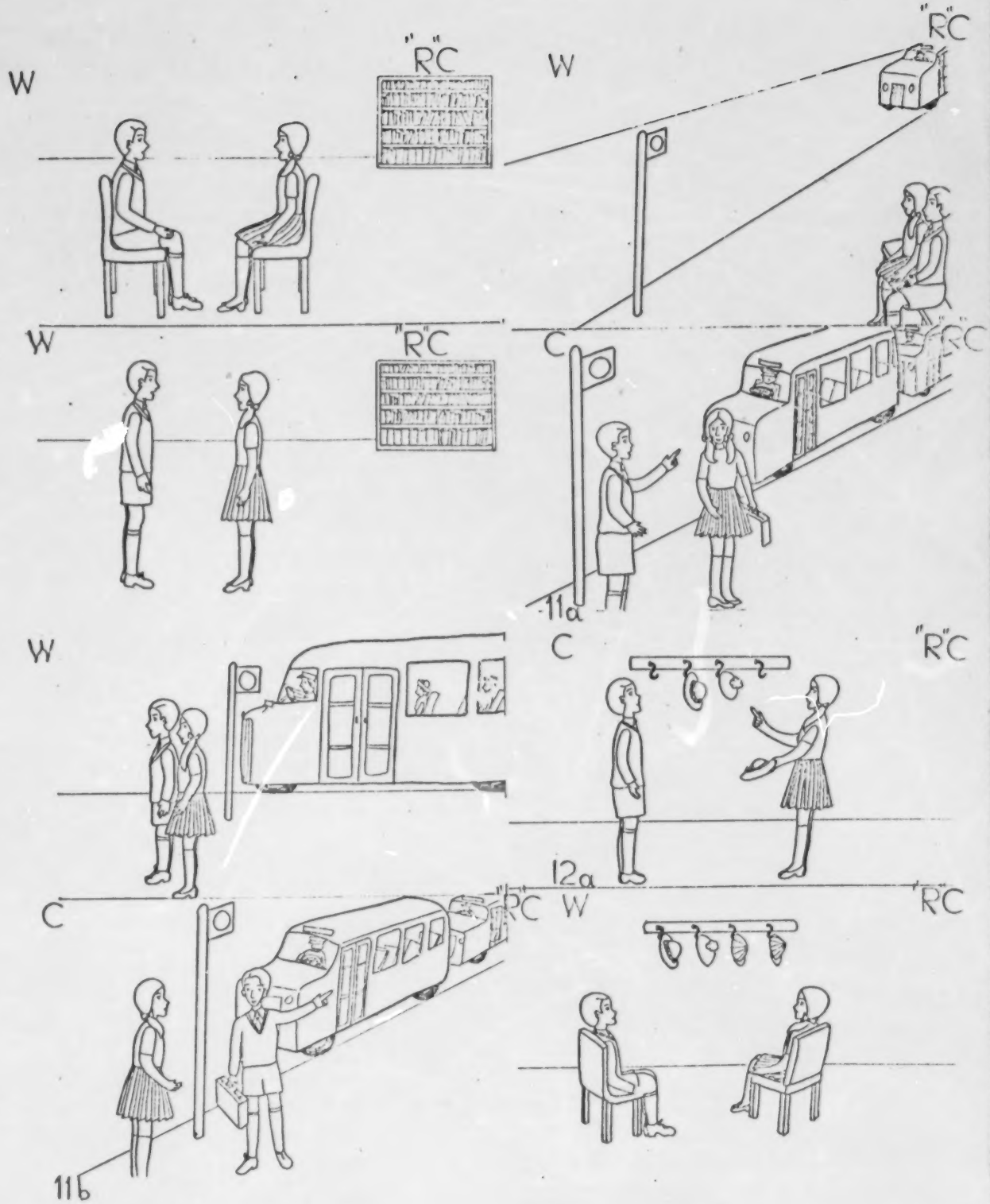
lob


W
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W
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W
"RC"
C
"RC"
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W
C
"RC"
12a
C
"RC"
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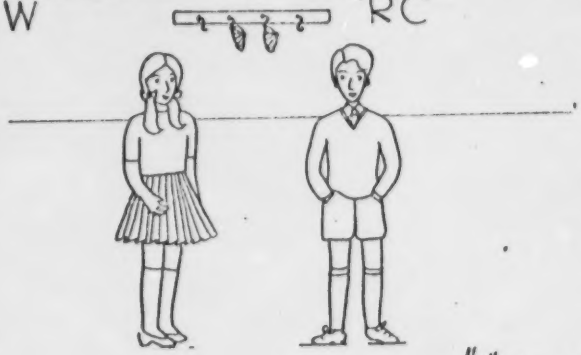
C "R" C

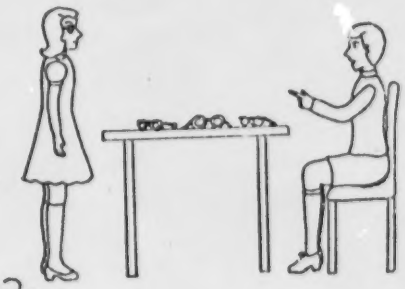
12b

W "R" C



W "L" A or A'

C "L" A or A'



13a

W "L" A or A'

C "L" A or A'

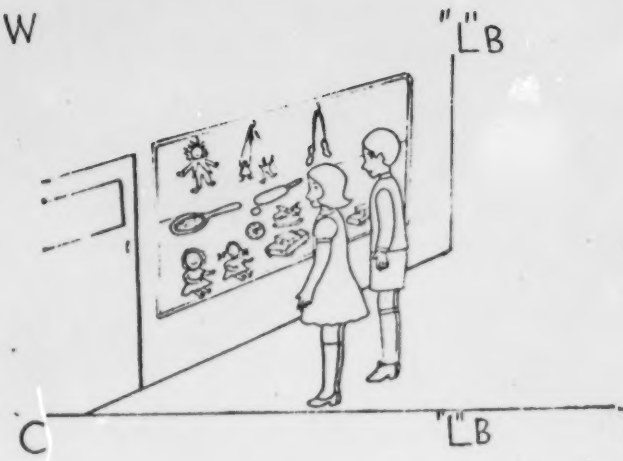
14a

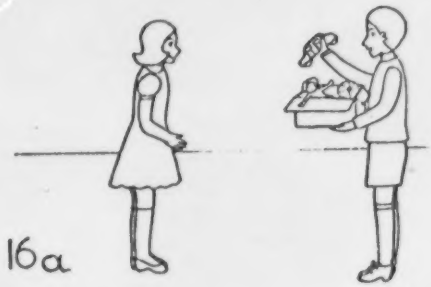
W "L" A or A'

C

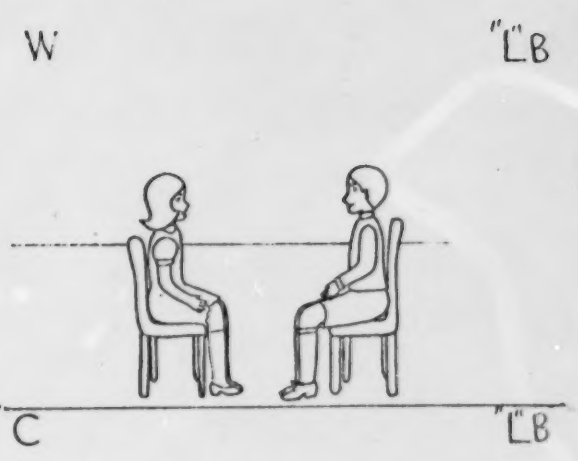
15a

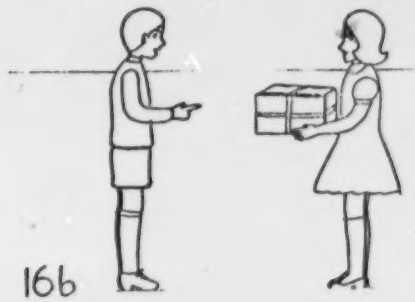
(con't)



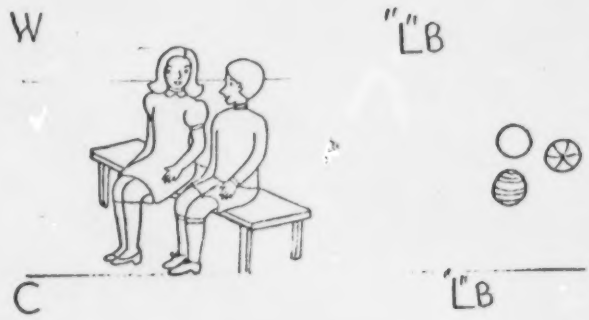


16a

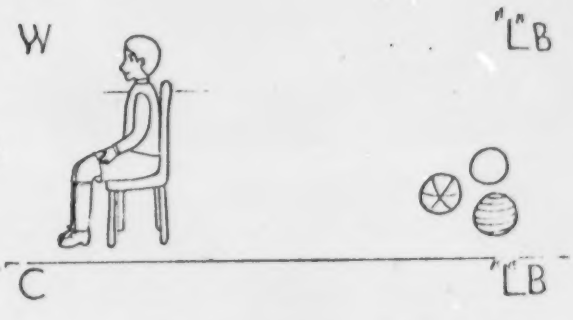


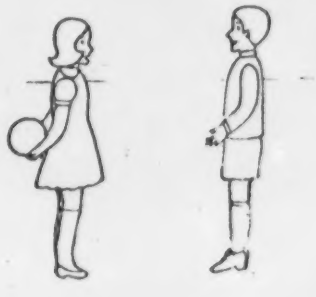


16b



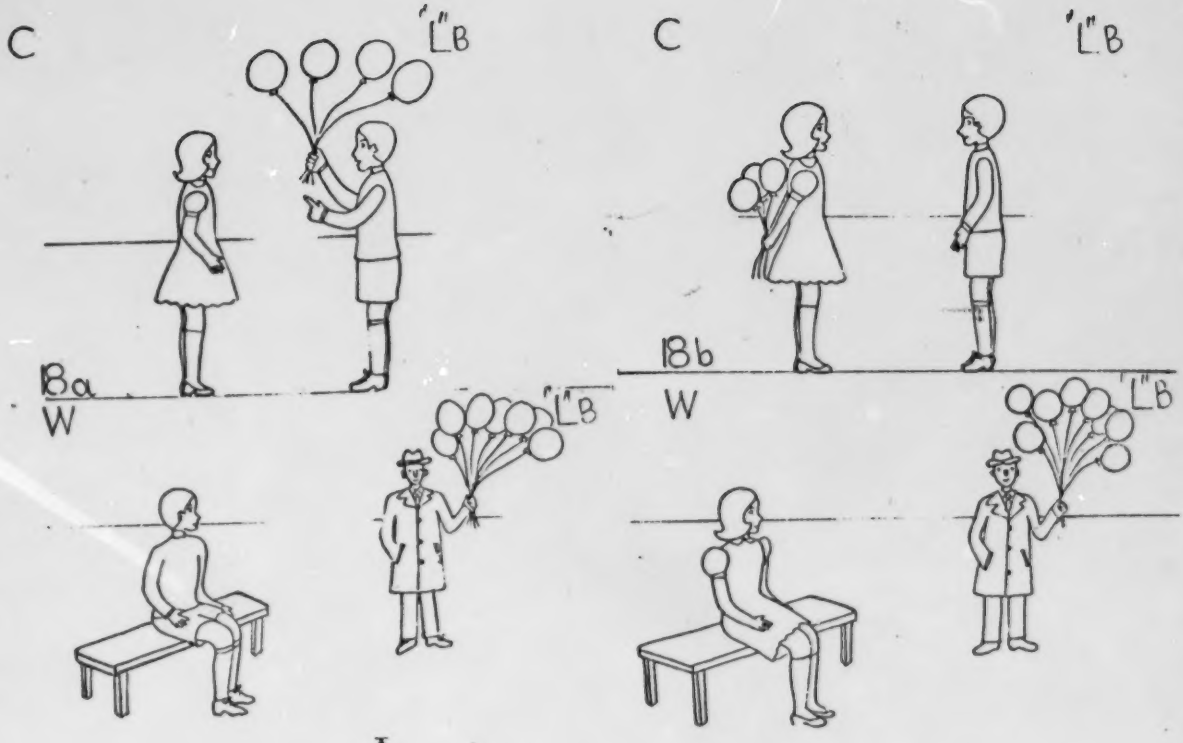
17a

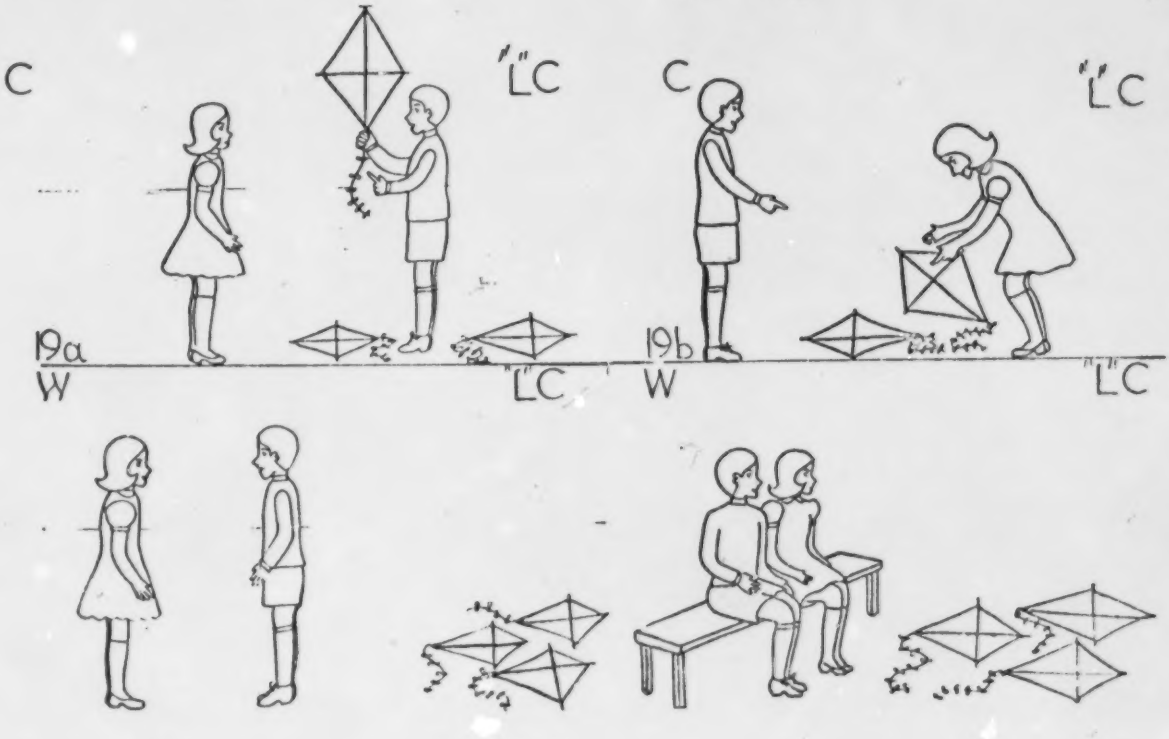


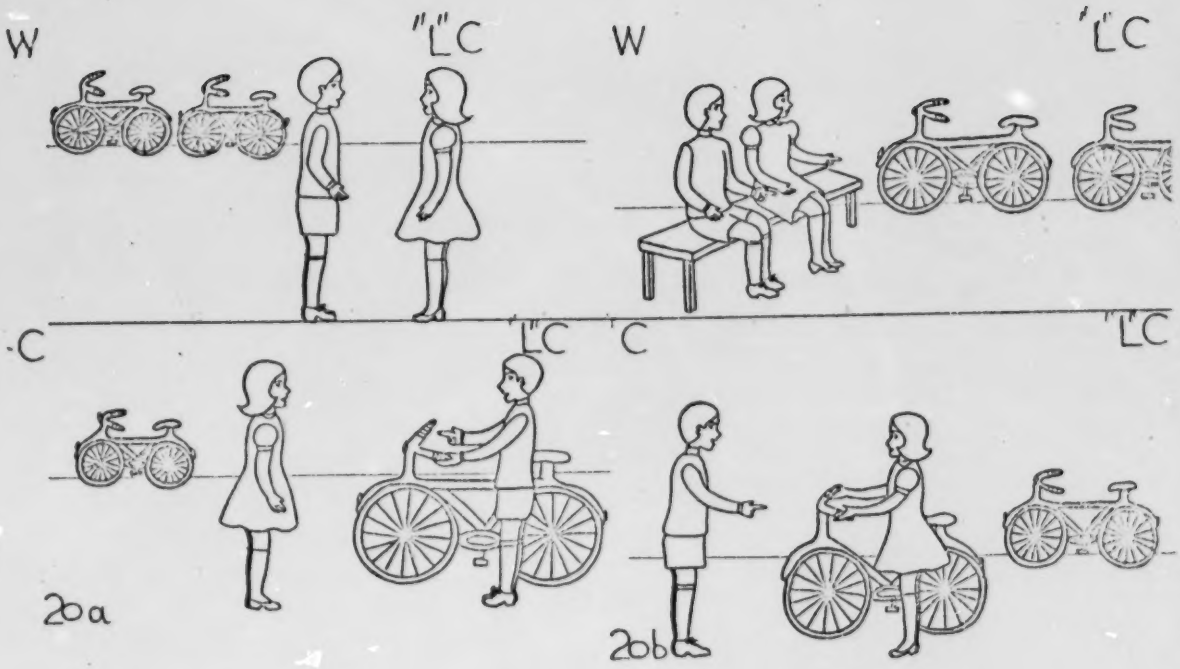


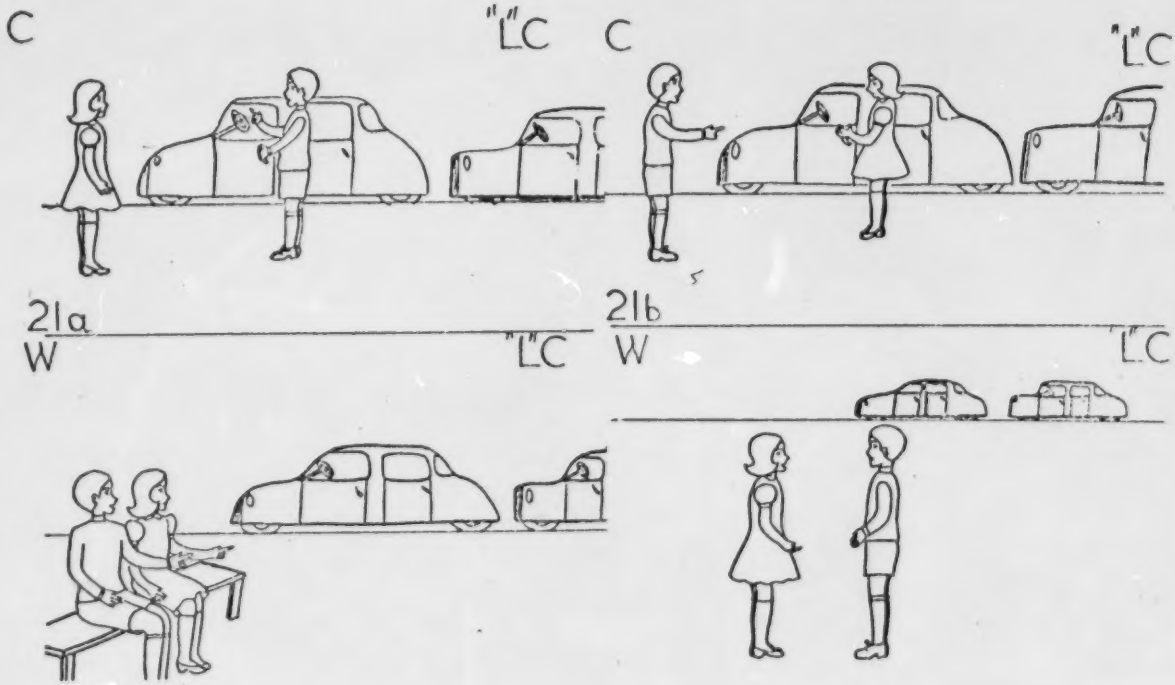
17b

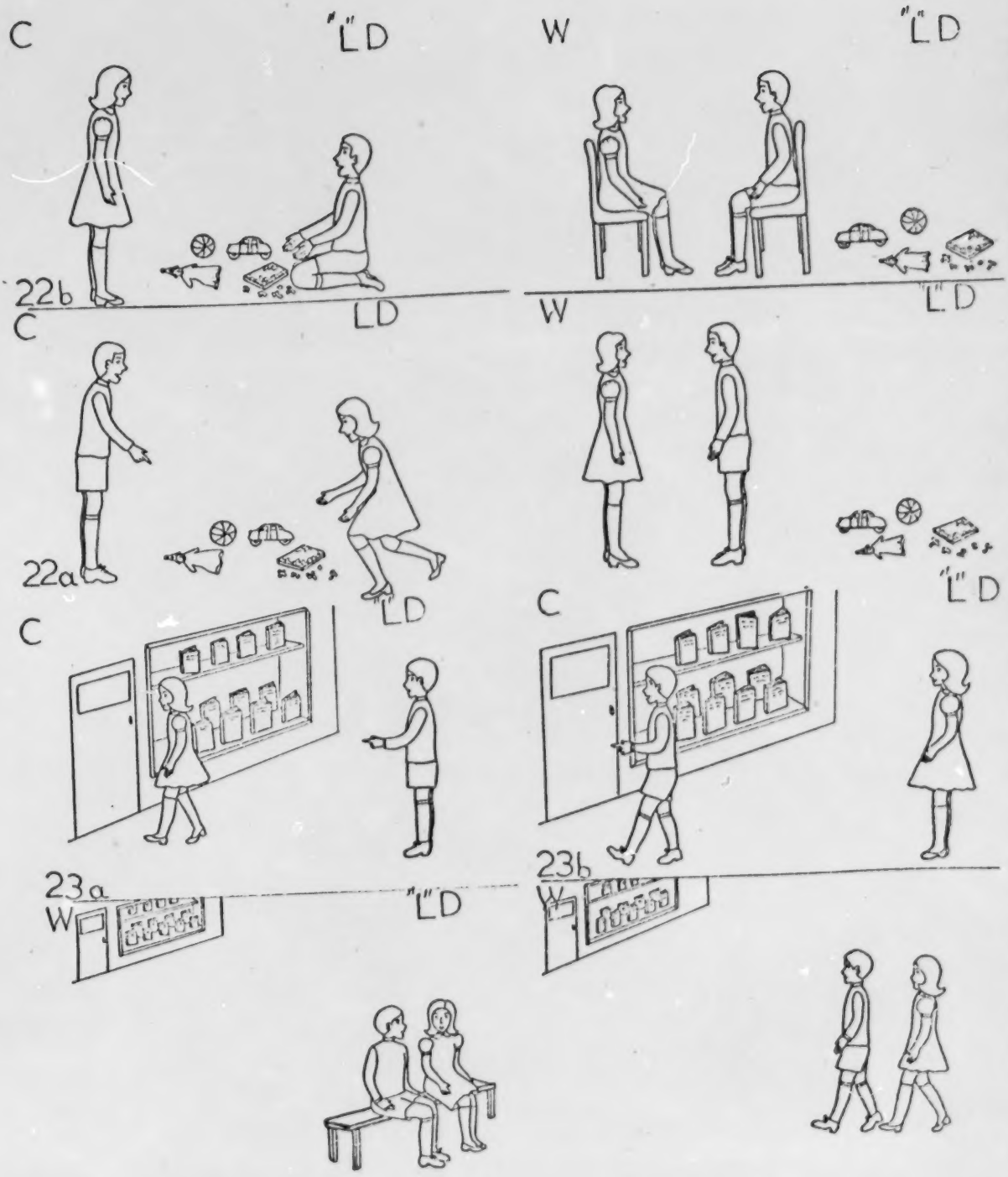
(cont'd)

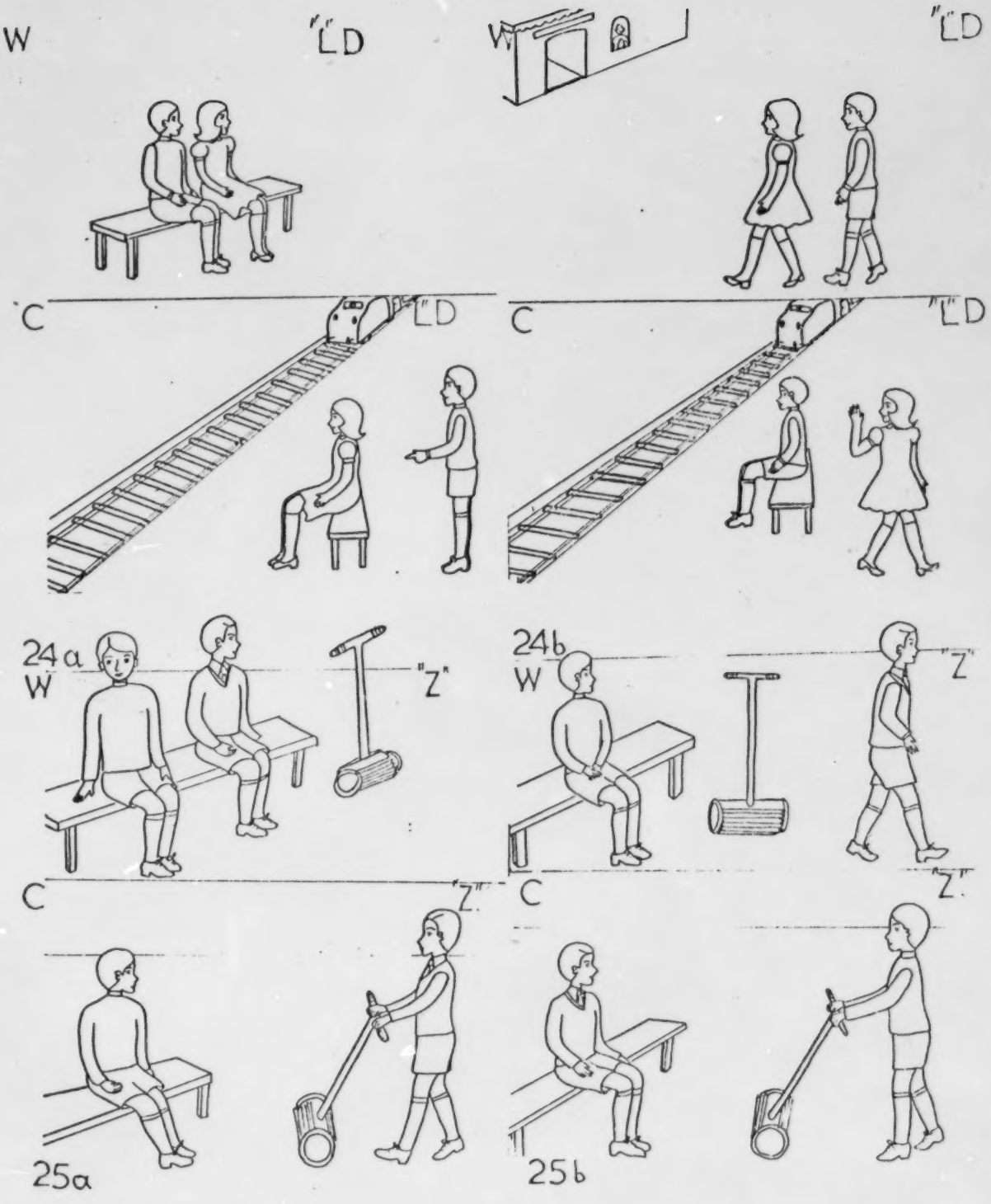


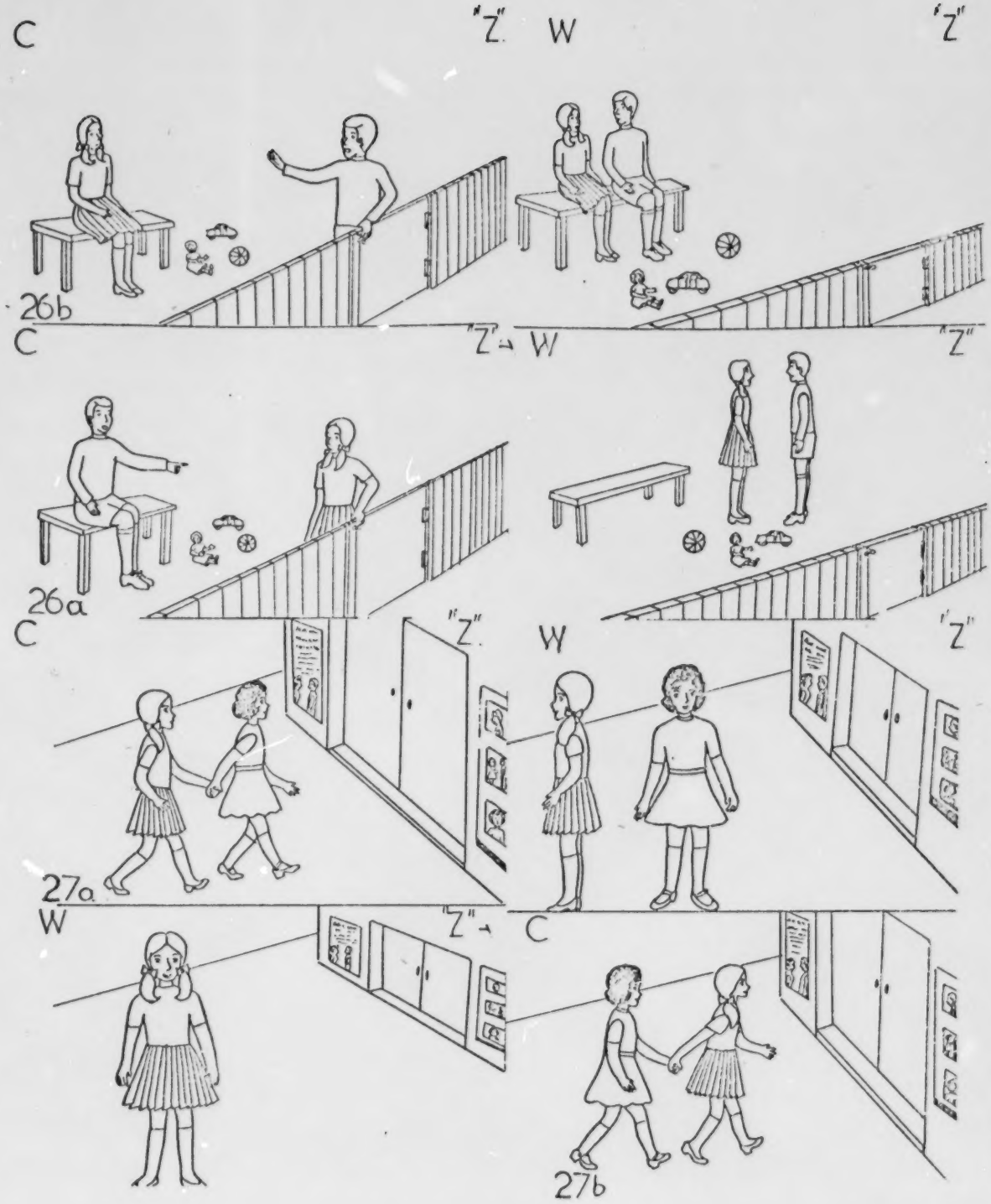


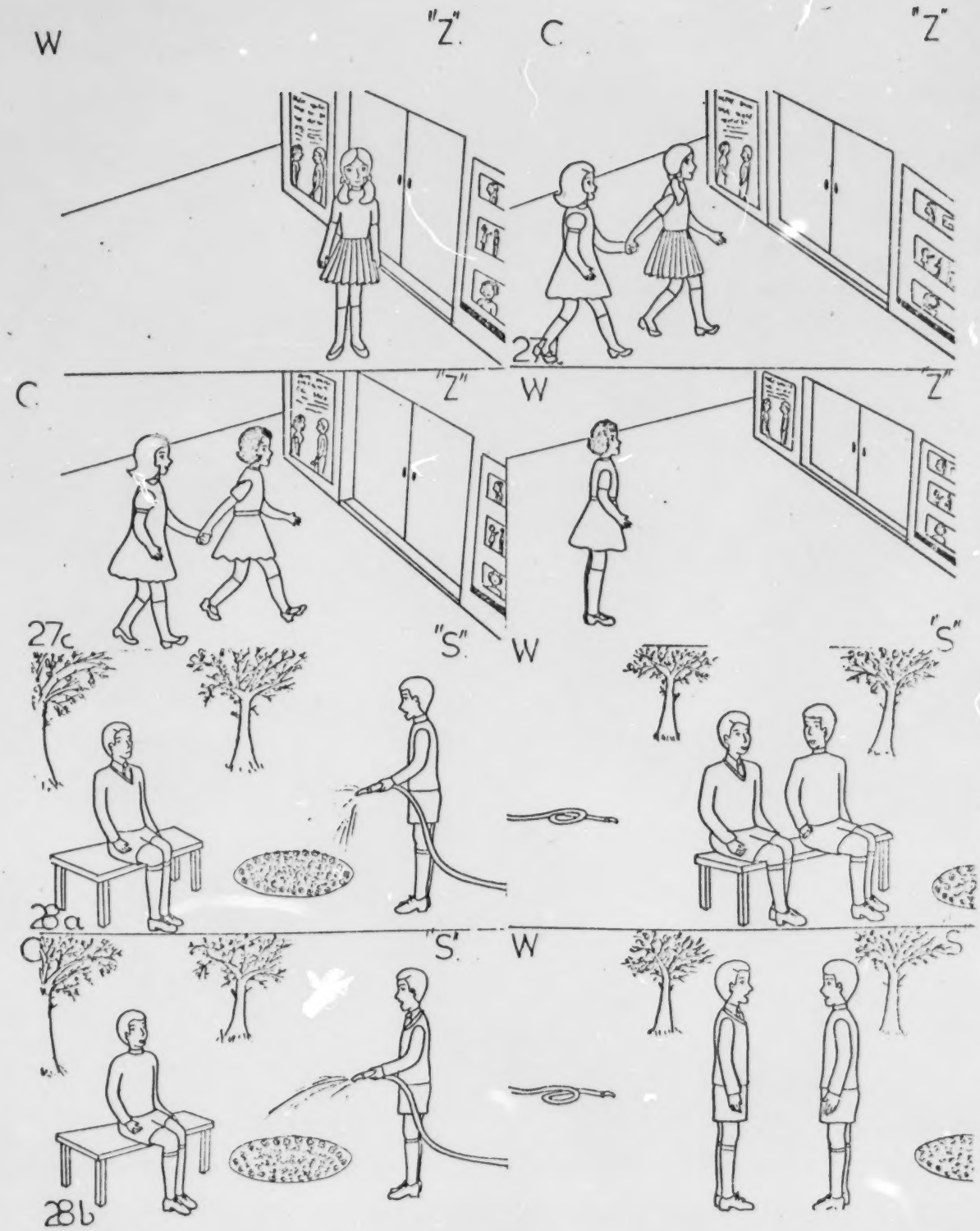

W
"L"C
W
'L'C
C
"L"C
C
"L"C
20a
20b

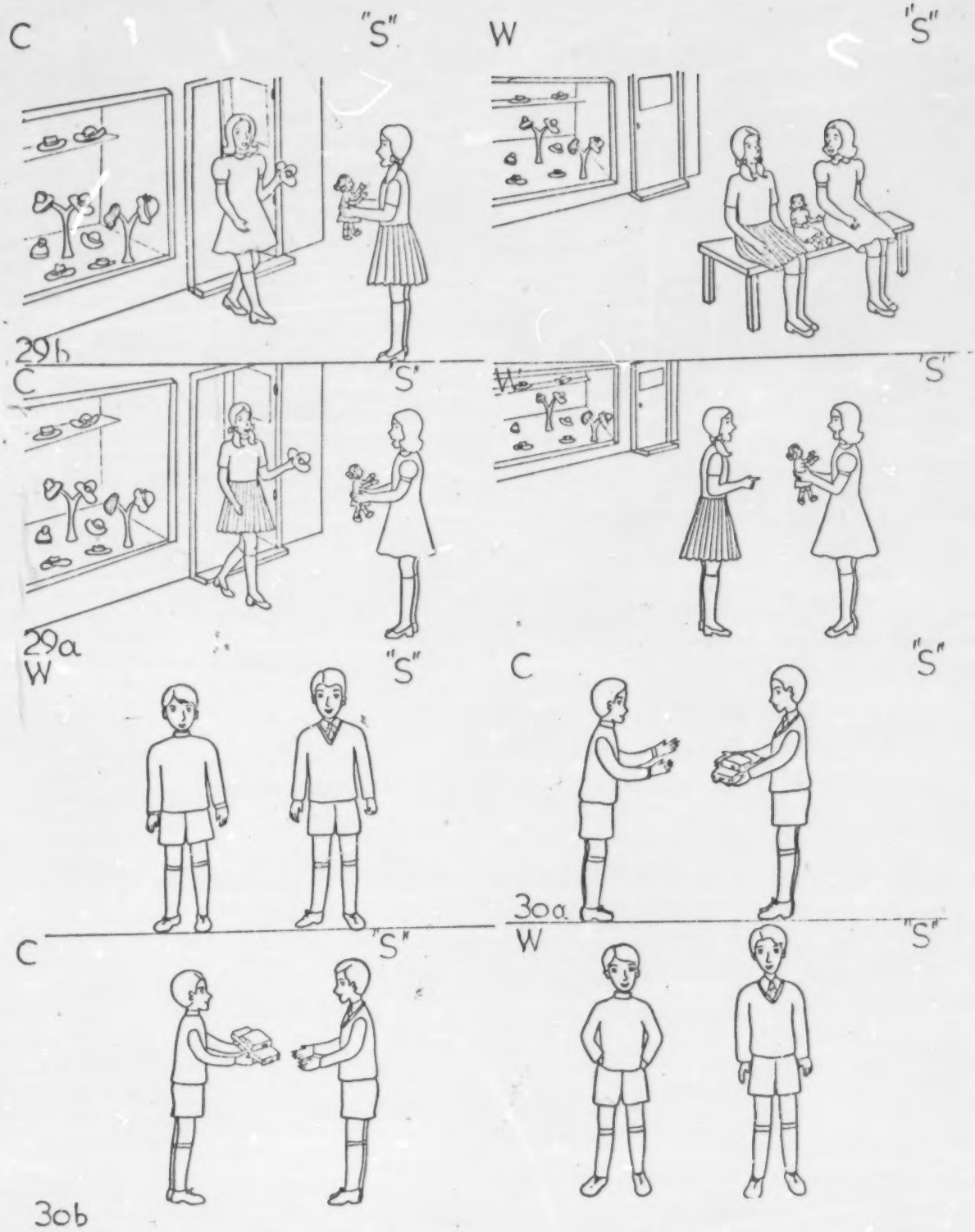

C
"L"C
C
"L"C
21a
W
"L"C
21b
W
'L'C

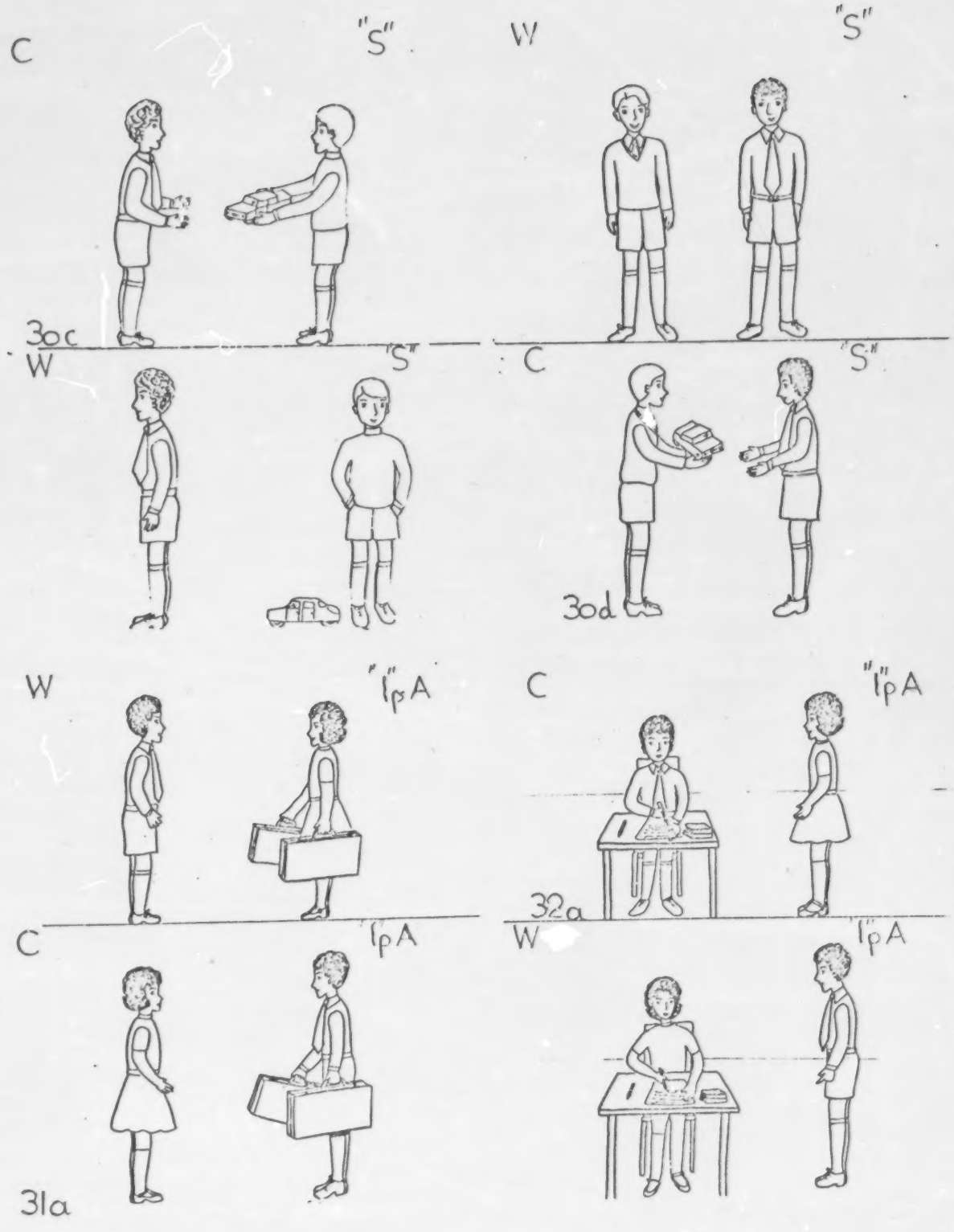

C
"L"D
22b
LD
W
"L"D
"L"D
C
22a
LD
W
"L"D
C
C
23a
W
"L"D
23b
W

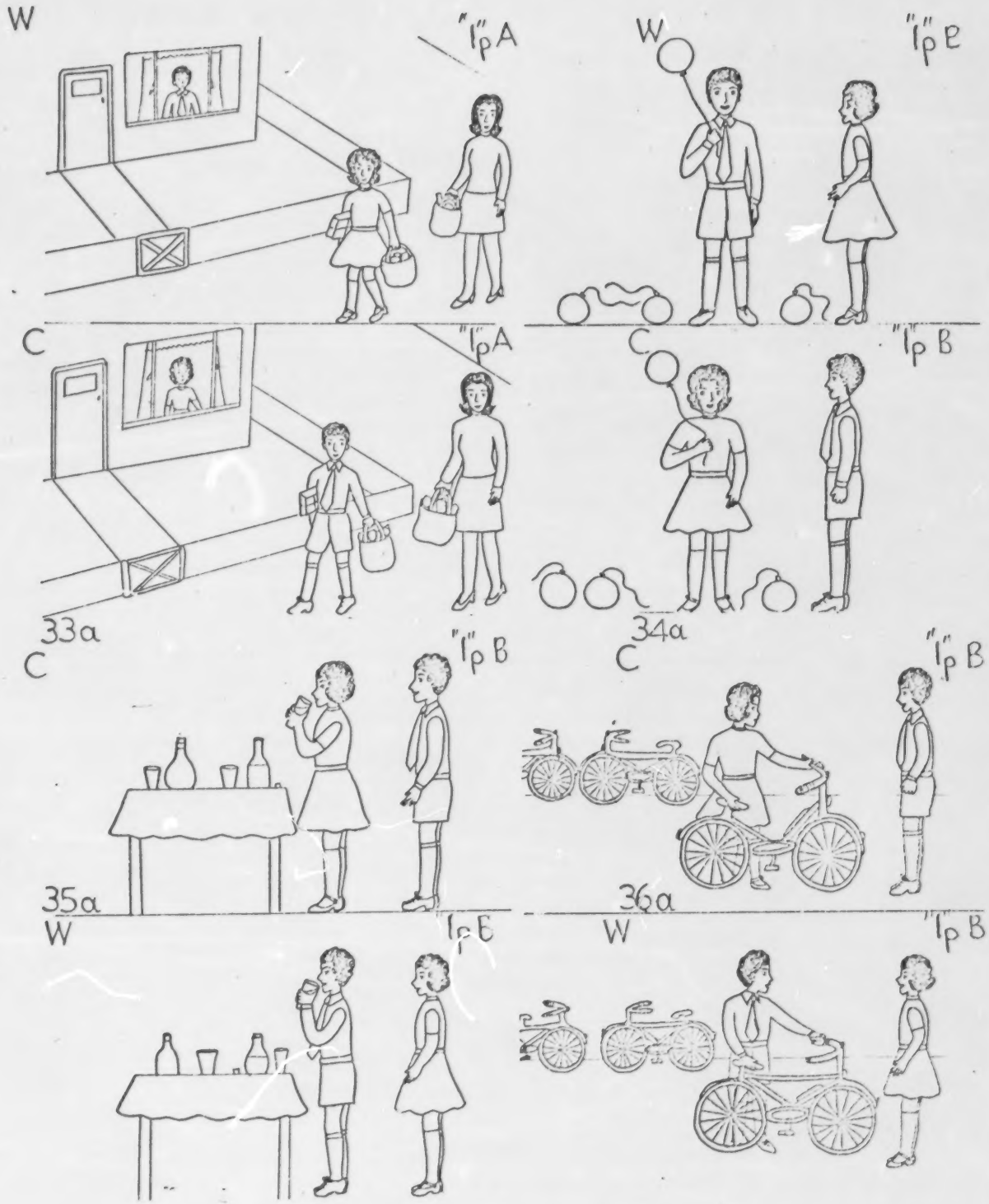

W
"LD
W
"LD
C
"LD
C
"LD
24a
W
"Z"
24b
W
"Z"
C
"Z"
C
"Z"
25a
25b

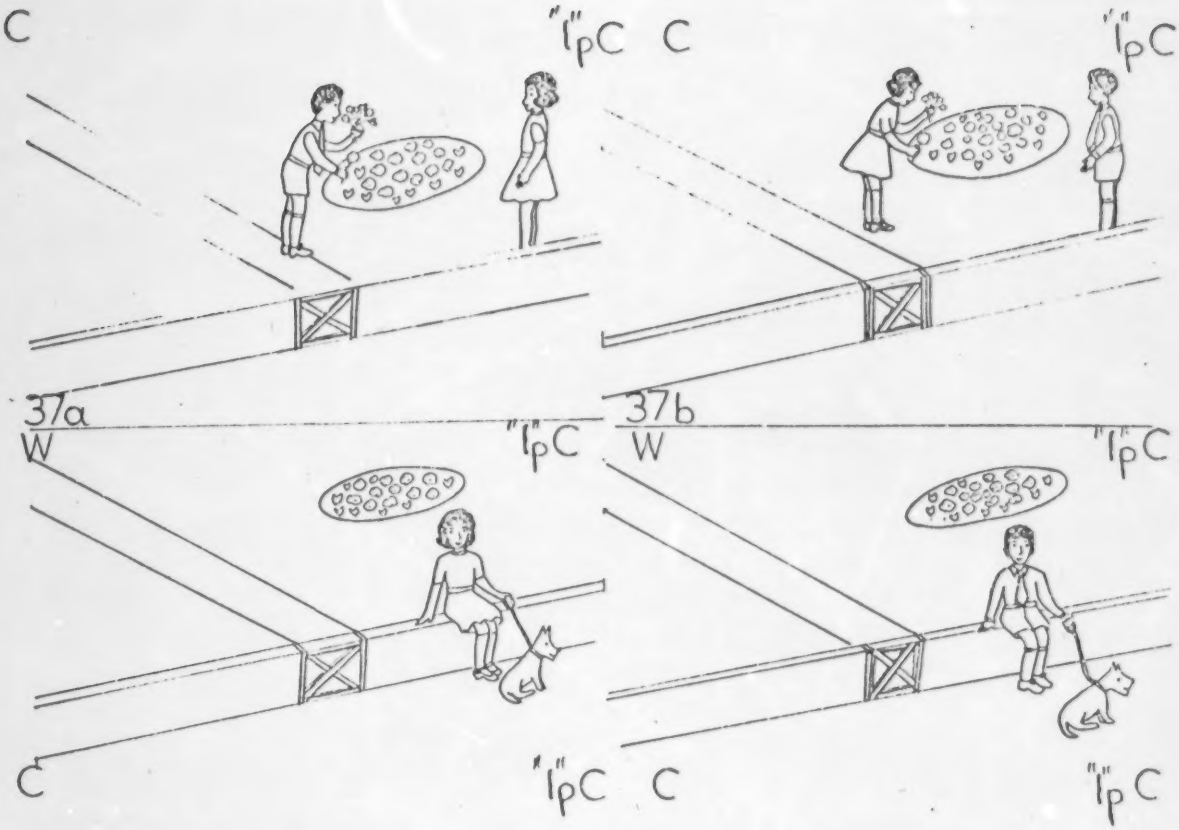

C
"Z"
W
"Z"
26b
C
"Z"
W
"Z"
26a
C
"Z"
W
"Z"
27a
W
"Z"
C
27b

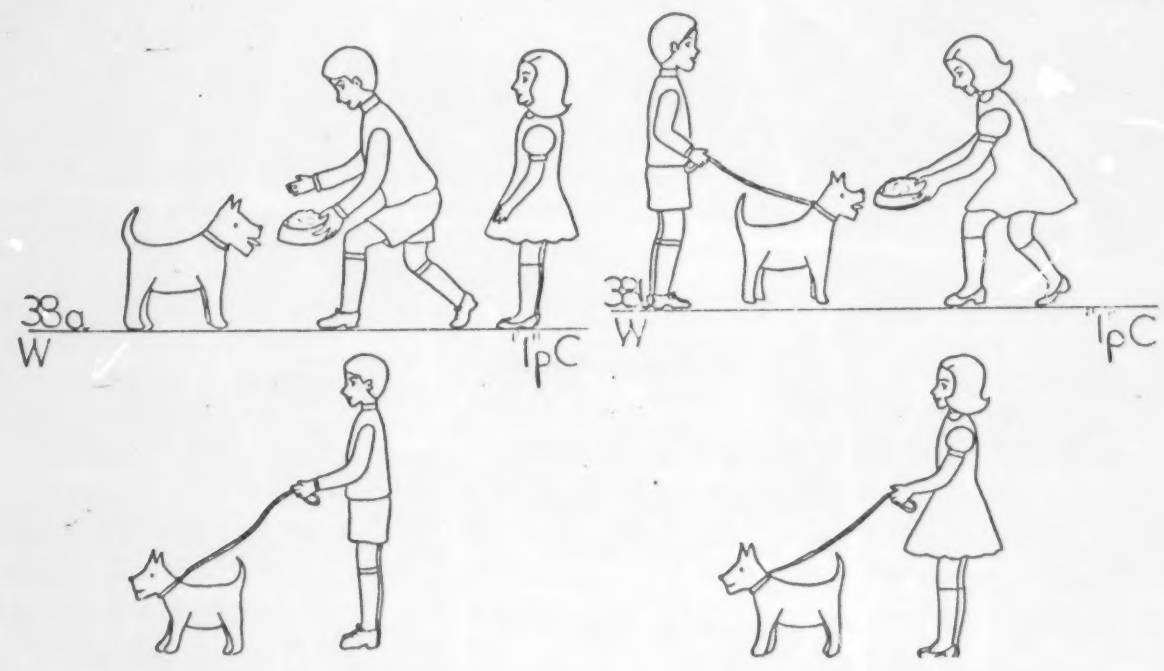

W
"Z"
C
"Z"
27a
C
"Z"
W
"Z"
27c
"S"
W
"S"
28a
"S"
W
28b


C
"S"
W
"S"
29b
C
"S"
"S"
29a
W
"S"
C
"S"
30a
C
"S"
W
"S"
30b


C
"S"
W
"S"
30c
W
"S"
C
"S"
30d
W
"I"pA
C
"I"pA
32a
C
"I"pA
W
"I"pA
31a


W
"I"p A
W
"I"p B
C
"I"p A
C
"I"p B
33a
34a
C
"I"p B
C
"I"p B
35a
36a
W
I p B
W
"I"p B

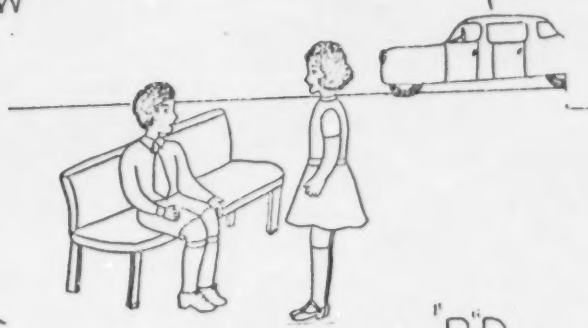

C
"I"pC
C
"I"pC
37a
W
"I"pC
37b
W
"I"pC
C
"I"pC
C
"I"pC


38a
W
"I"pC
38b
W
"I"pC

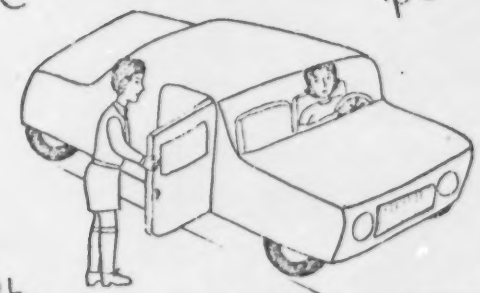
C "I" pC

39a
W

"I" pC



C "I" pC



39b
W

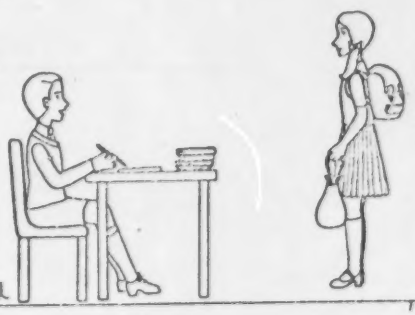
"I" pC

C "R" D

40a
W

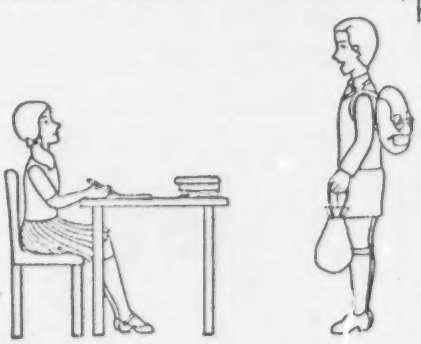
"R" D

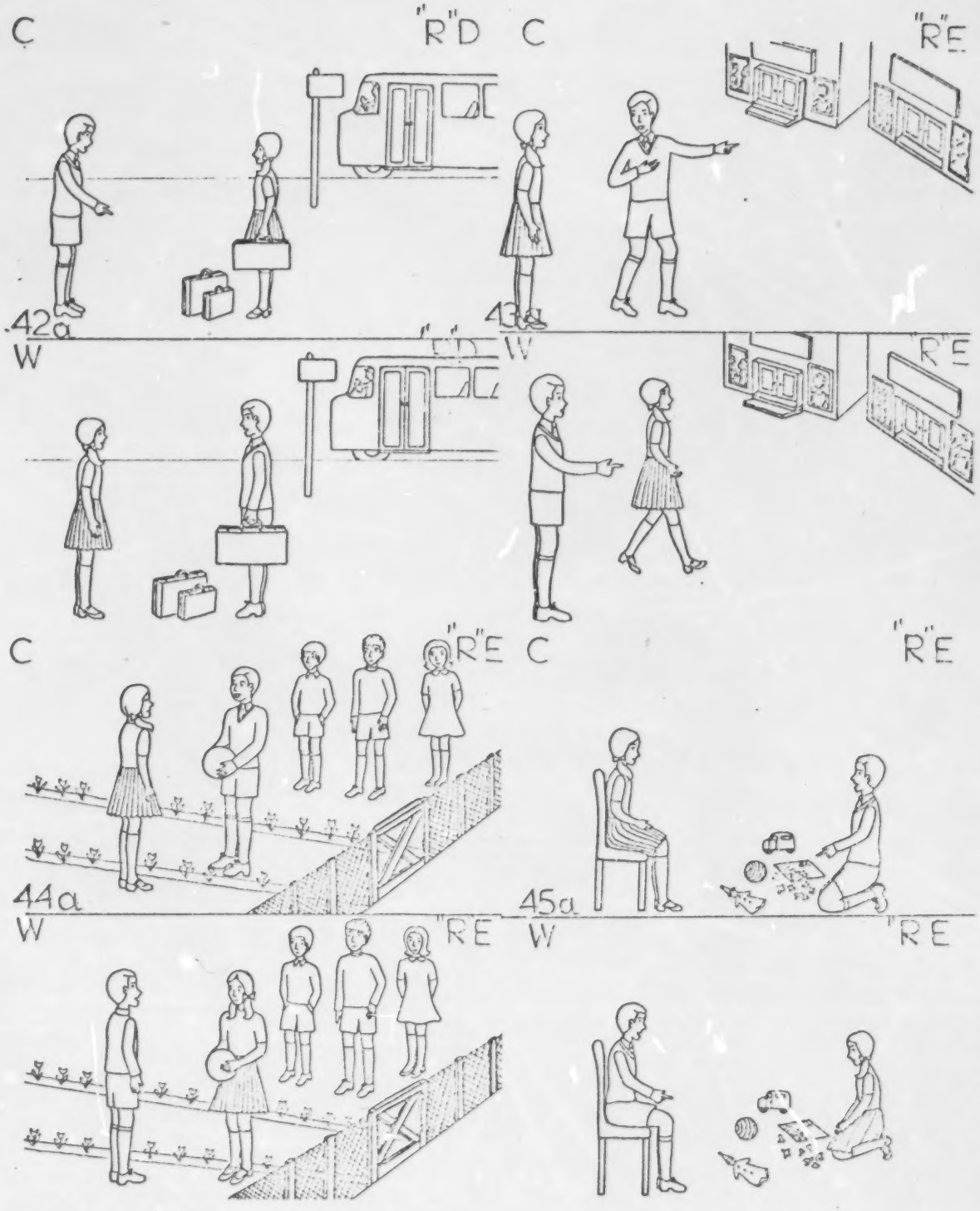
C "R" D

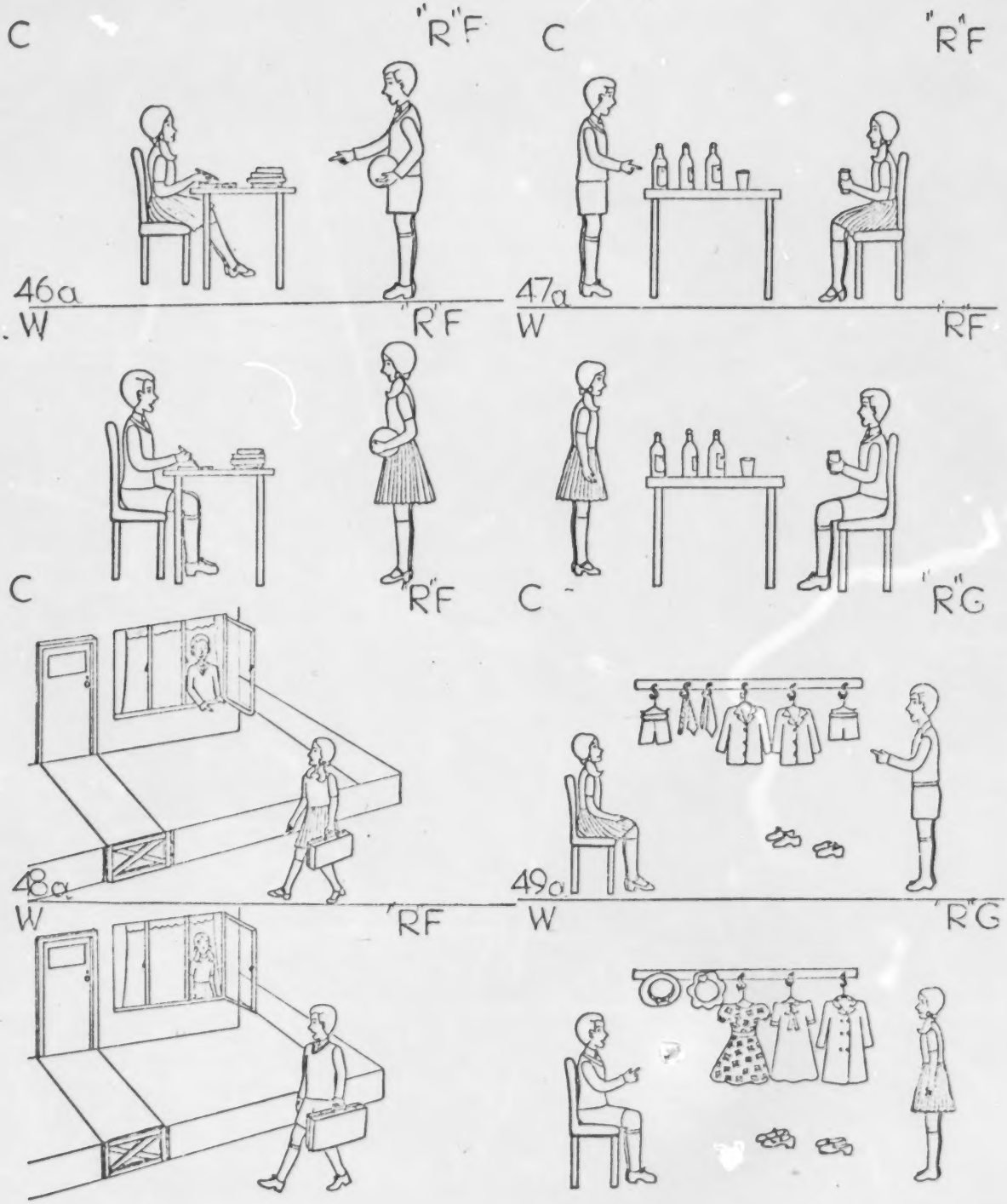


41a
W

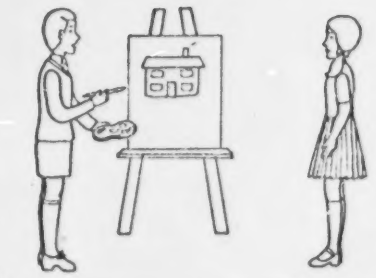
"R" D



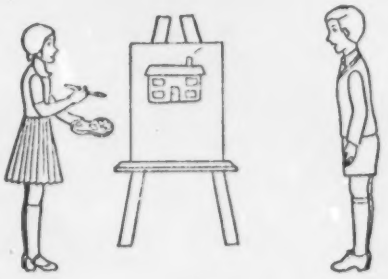

C
"R"D
C
"R"E
42a
W
43a
W
"R"E
C
"R"E
C
"R"E
44a
W
"RE
45a
W
"RE


C
"R"F
46a
W
'RF
C
"R"F
47a
W
RF
C
'RF
C
"R"G
48a
W
'RF
49a
W
'RG

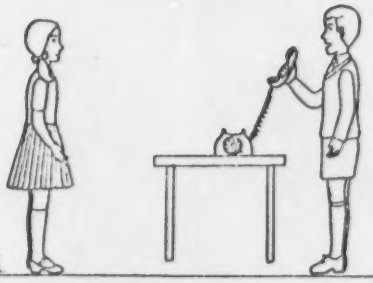
C "R"G



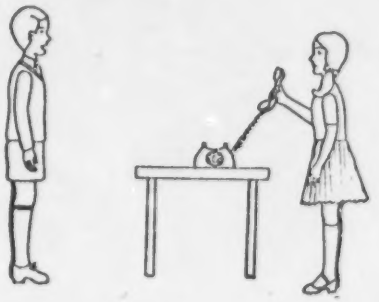
50a
W "R"G



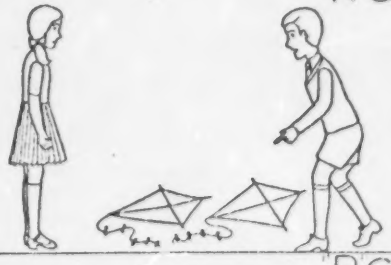
C "R"G



51a
W "R"G

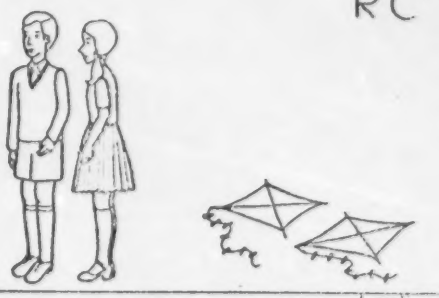


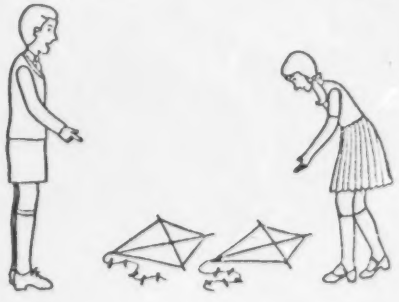
C "R"C'



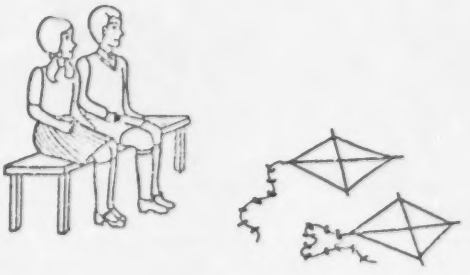
52a
C "R"C'

W "R"C'





52b



C "R"C' W "R"C'

53a

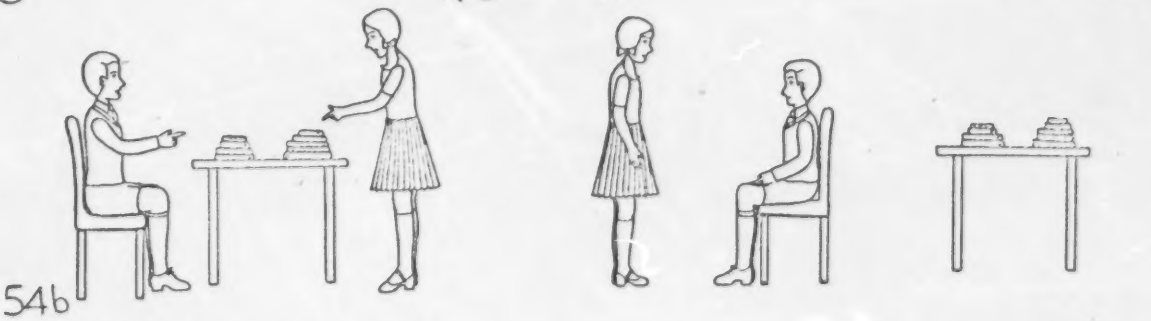
C "R"C' W "R"C'

53b

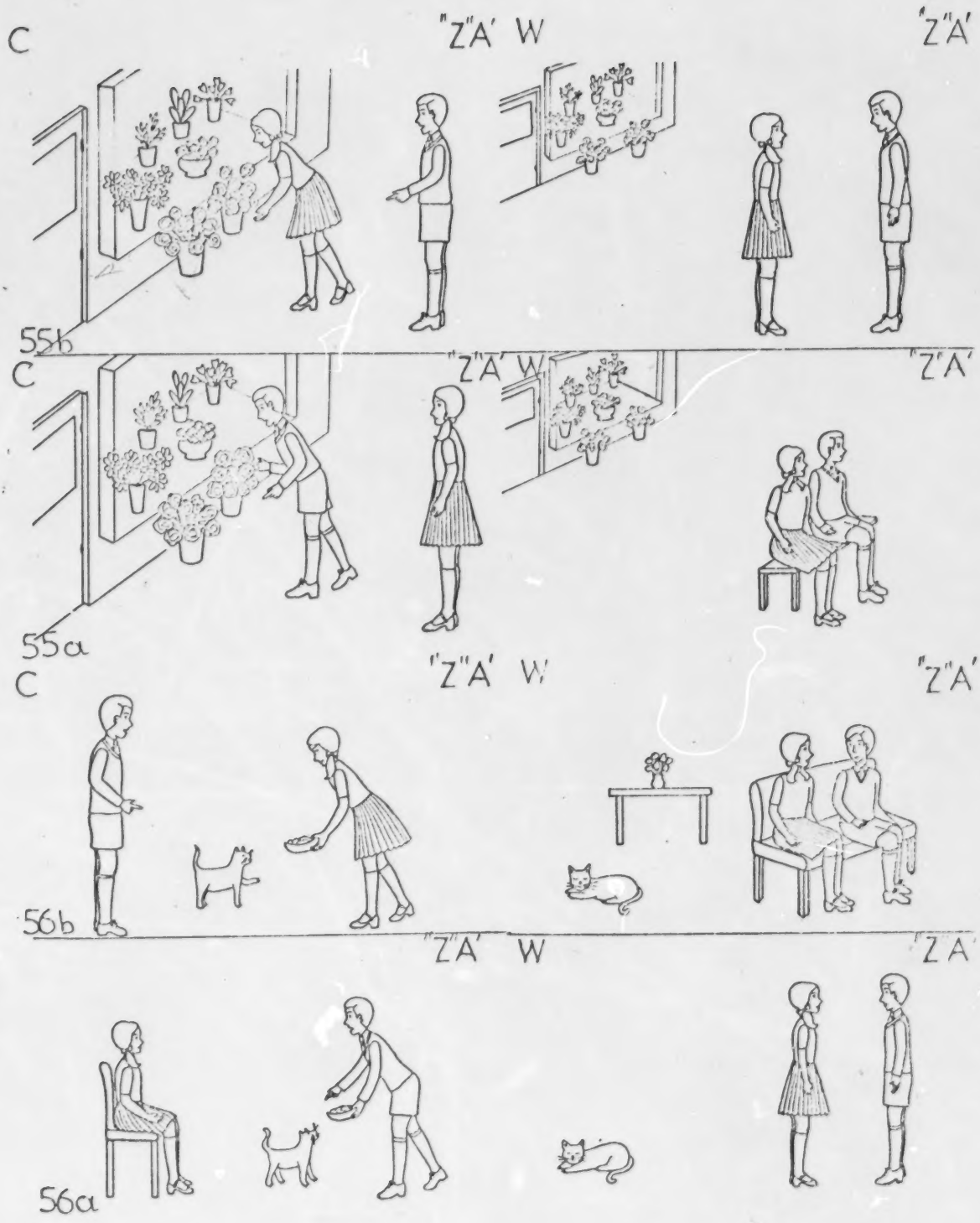
C "R"C' W "R"C'

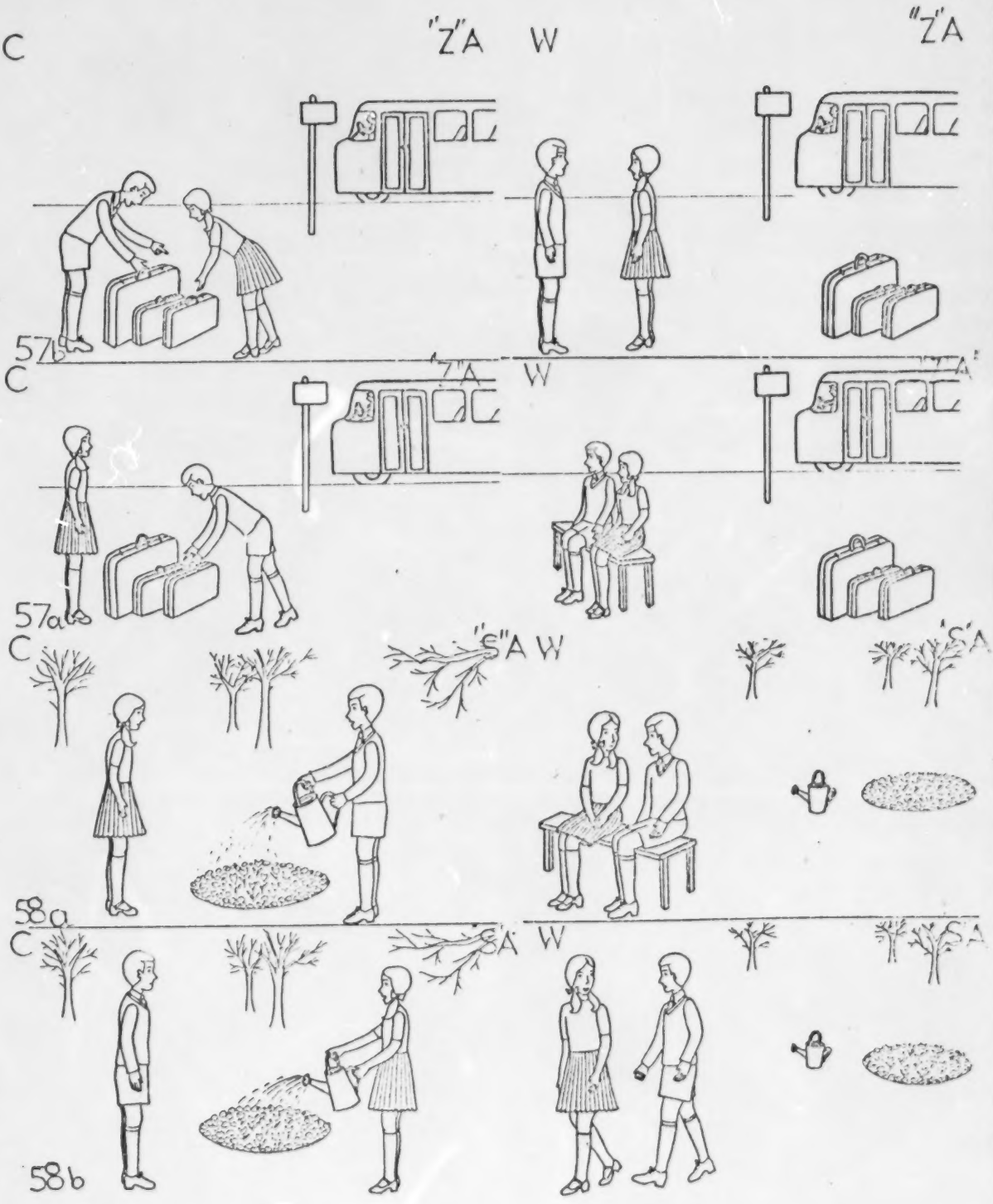
54a

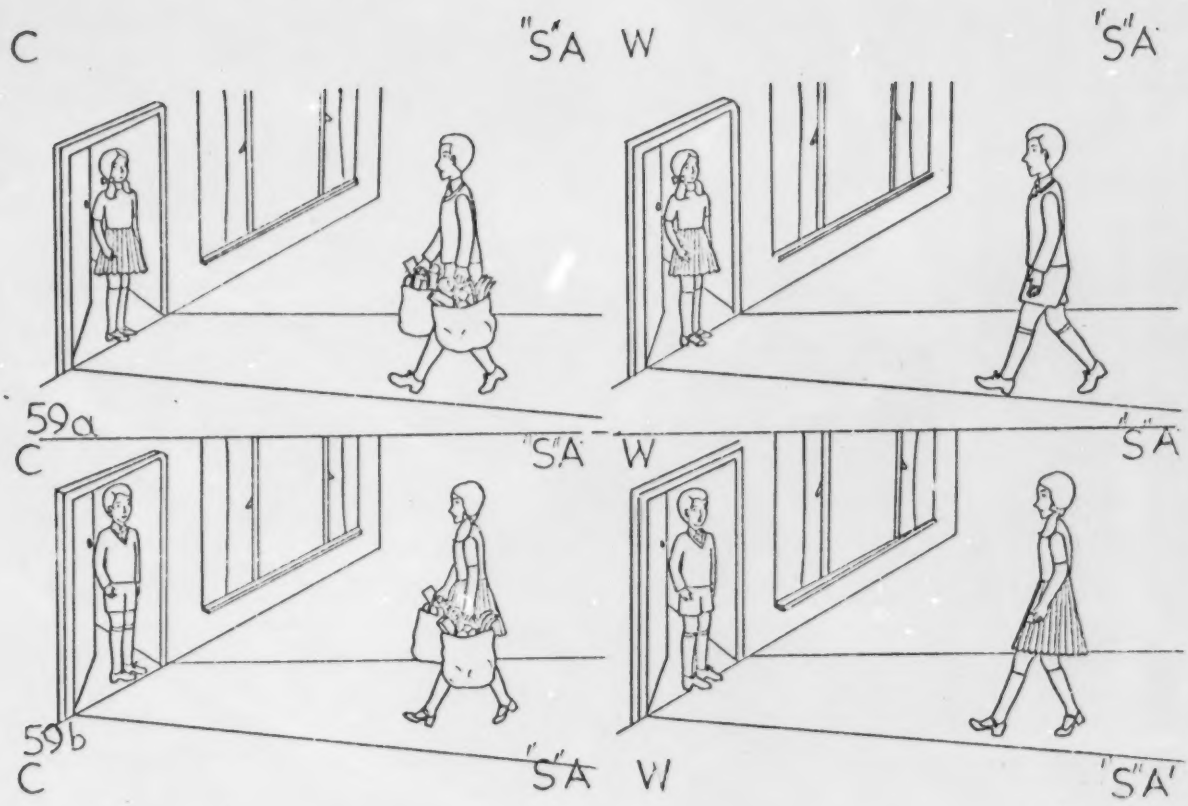
C "R"C' W "R"C'



54b

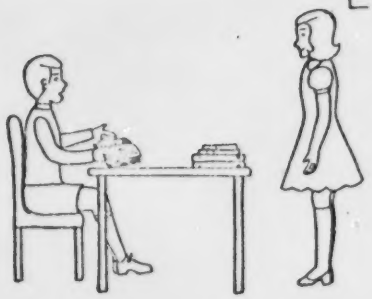

C
"Z"A' W
"Z"A'
55b
C
"Z"A' W
"Z"A'
55a
C
"Z"A' W
"Z"A'
56b
"Z"A' W
"Z"A'
56a


C
"Z"A W
"Z"A
57b
C
"Z"A W
57a
C
"S"A W
"S"A
58a
C
"S"A W
"S"A
58b


C
"S"A
W
"S"A
59a
C
"S"A
W
"S"A
59b
C
"S"A
W
"S"A

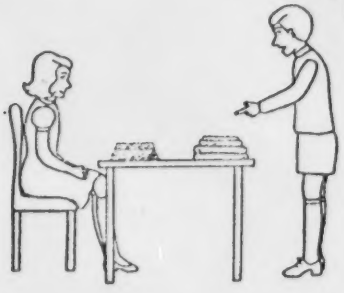
60a
C
"S"A
W
"S"A
60b

C "LE



61a

W "LE

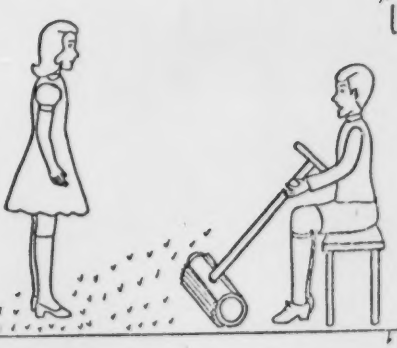


C "LE

63a

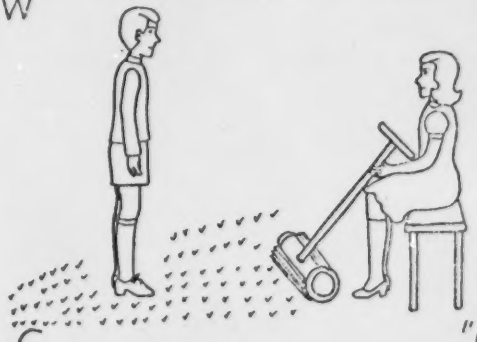
W "LE

C "LE

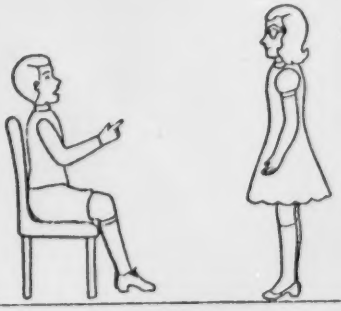


62a

W "LE

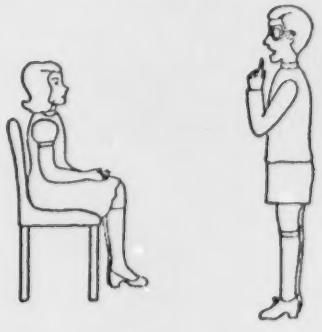


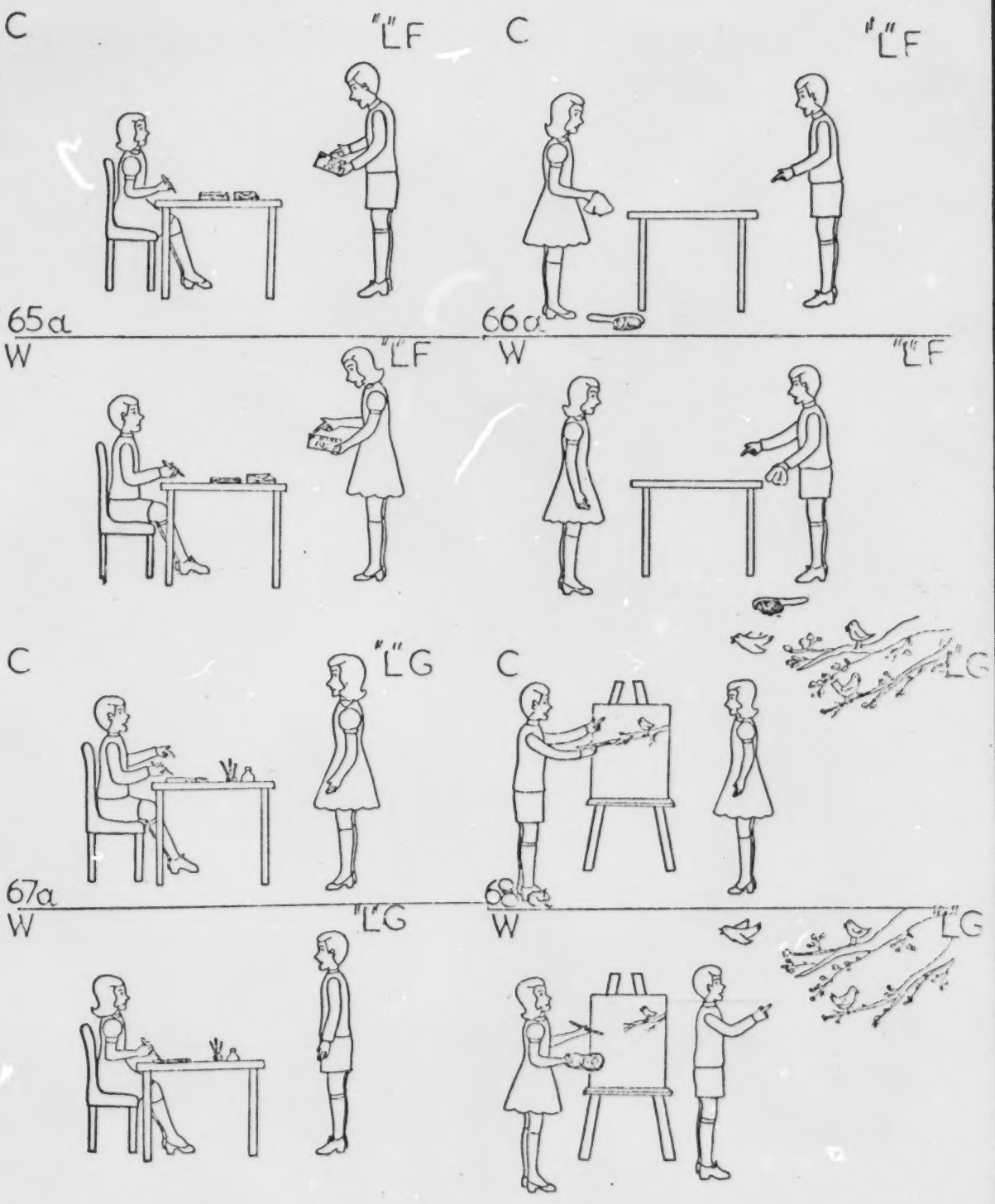
C "LE

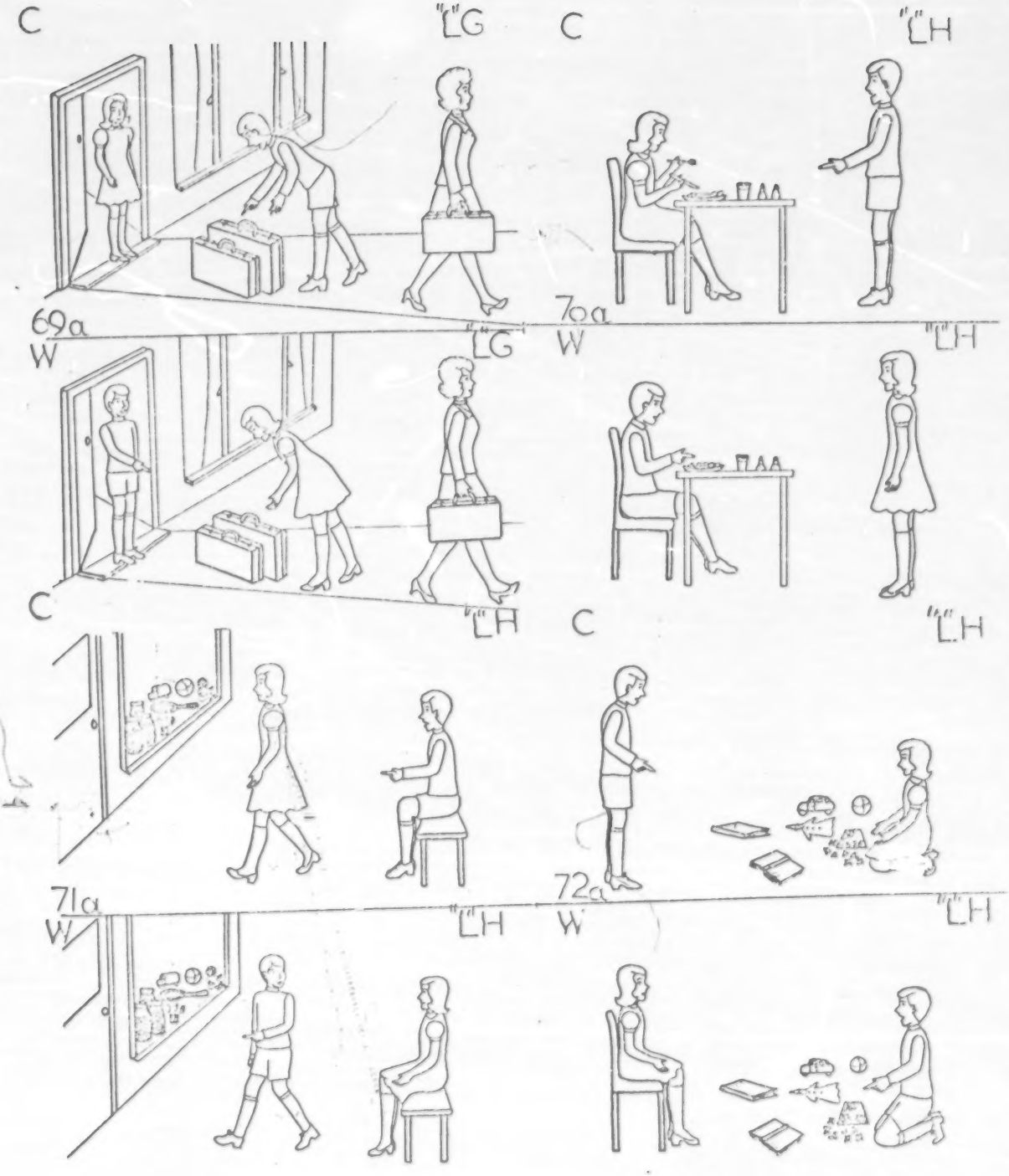


64a

W "LE




C
"L"F
65a
W
"L"F
C
"L"F
66a
W
"L"F
C
"L"G
67a
W
"L"G
C
"L"G
68
W
"L"G


C
"LG
C
"LH
69a
W
"LG
70a
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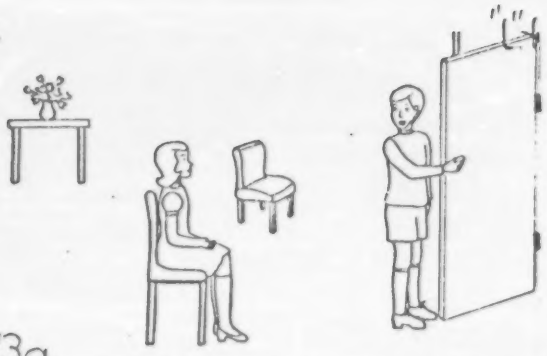
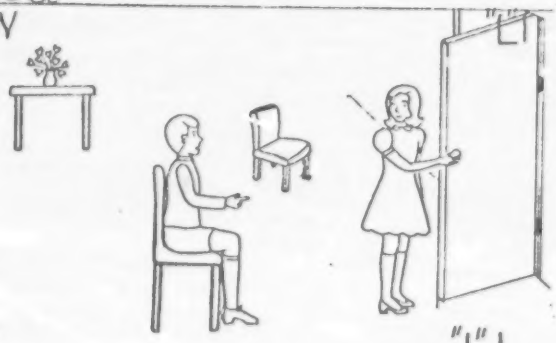
"LH
71a
W
"LH
72a
W
"LH

C



73a

W



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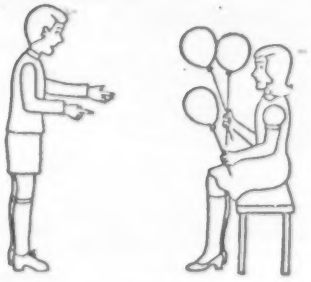

75a

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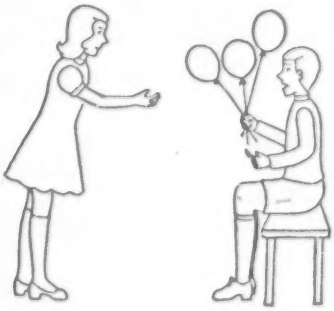

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74a

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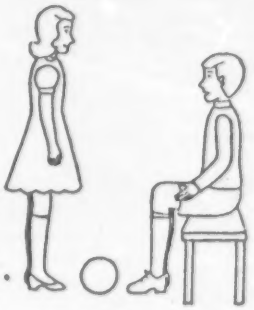

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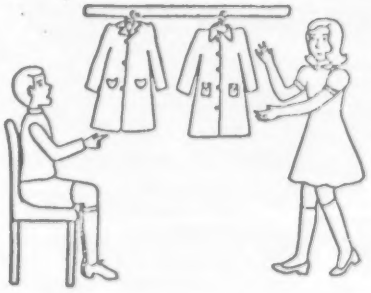
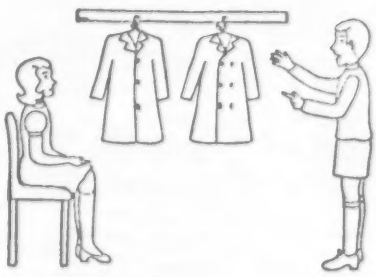


76b

C



76a

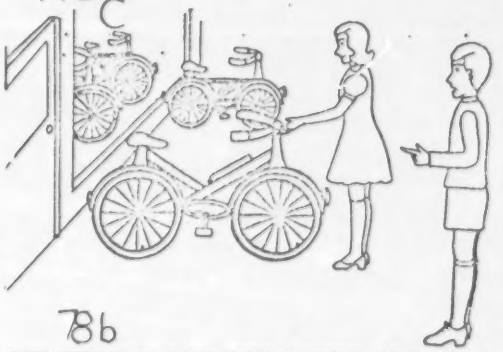
W "L" C' C "L" C'

77a

W "L" C' C "L" C'

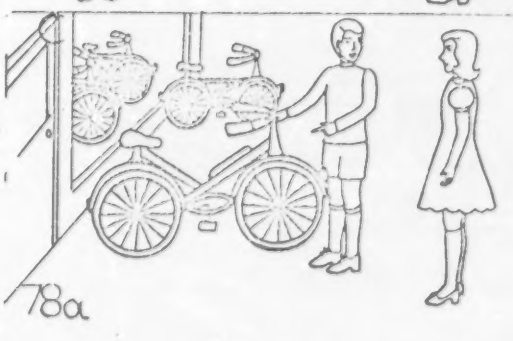
77b

W "L" C' C "L" C'



78b

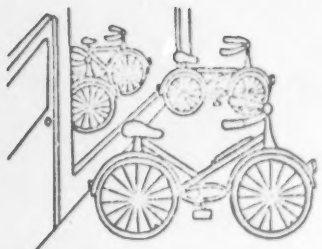
W "L" C'



78a

W

"LC'



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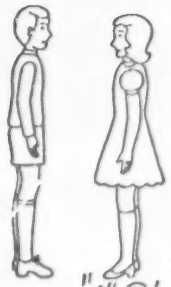

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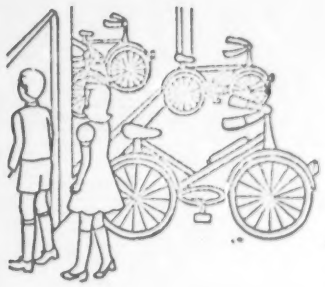

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